Indy Champs Foyt, Ward, Jones Preview '65 Race

POPULAR MECHANICS

MAY 1965
35 CENTS

Corvair Owners Report • How Good Are Corfam Shoes?

Unmasking Mars: What Our Flyby Will Prove

CAMPING FUN—26 pages: Clever New Outdoor Gear
Boating Cookery • Picnic Cooler Buyer's Guide • Parachute Tents

PM's Carry-All
CHUCK WAGON

FLEETSIDE PICKUP

Trim-lined Fleetsides come with 6½- or 8-ft bodies, and include such features as front and rear coil-spring suspensions, self-adjusting brakes and big 3-man cab. Larger body on tough ¾-ton chassis is the most popular camper choice. Four-wheel-drive is available for these models.

STEPSIDE PICKUP

Here are economical pickup models offered in the same range of body sizes and with the same features as the Fleetsides above. In addition, there's a big Stepside pickup with 9-ft. body on a tough 1-ton chassis — just the ticket for those who need extra room and ruggedness.

CARRYALL

Seats six with lots of luggage space in rear. Also available with seating for eight. Large double rear doors are offered in two styles — side opening or popular tailgate-liftgate type. Work-proved coil-spring suspensions, front and rear, smooth the miles away to let you arrive fresh and ready to go.

EL CAMINO

Here's the beauty queen of the Chevy line. Its versatility and good looks make it equally at home at a campsite or in a suburban driveway. Roomy 6½-ft. pickup box can carry over a half-ton of camping gear, or be fitted with special camper bodies such as the one illustrated at right.

For new vacation pleasure

Check the big Chevy choice in campers

What's the surest way to keep your camping vacation full of fun and free of headaches? Simple! Make a Chevy your way of traveling!

For variety in ways to travel and range of price tags to choose from, Chevrolet offers a real supermarket of values. There are pickups with 6½-, 8- and 9-foot boxes to handle a wide range of camper bodies. Or you can put a unitized camper on one of the Chevy chassis-cabs. If you're headed for the back country, you can order 4-wheel-drive for most units.

Or, perhaps you like the new "traveling home" idea — roomy vans all fitted out with modern comforts and conveniences. You can choose a basic Chevy-Van body for custom fitting, or the big Step-Van fully equipped and ready to go. Either way gives luxurious traveling.

For carrying lots of people and equipment, and hauling a trailer, too, look at the versatile Carryall. You'll like its roominess and easy handling.

Pick a Chevy and you'll travel with comfort and confidence. Chevy chassis have proved their toughness and reliability in all kinds of demanding truck work. And you get a smooth ride that adds an extra dimension to your vacation pleasure.

With this big choice, and the Chevy reputation to back it up, you'll want to see your Chevrolet dealer soon. He'll be happy to give you a special camper brochure — or you can get one by writing to Chevrolet Division of General Motors, Detroit, Michigan 48202.

CHEVROLET

THE LONG STRONG LINE

STEP-VAN — This one's all new from Chevrolet. It gives mobile living at its luxurious best. Full stand-up head room, sleeping for four plus cooking and sanitary facilities. And you'll be pleasantly surprised at its low, low cost!

CHEVY-VAN—The roomy Chevy-Van is readily converted to provide handy cooking and sleeping facilities. Its 211-cu. ft. volume allows a variety of arrangements to suit individual preferences. Your Chevrolet dealer can give you full information about having such conversions done for you.

CHASSIS-CAB—Rugged Chevrolet chassis-cabs are offered in a range of wheelbases to fit many different sizes and styles of camper bodies. Big 3-man cab gives plenty of stretch-out room for comfortable traveling. Four-wheel-drive available for ½- and ¾-ton models.

BUICK MOTOR DIVISION

Superbird.

The Skylark Gran Sport.
400 cu. in. / 325 bhp.
Bucket seats.
Floor-shift, all-synchro 3 speed.
Heavy-duty suspension.
Oversized, 7.75 x 14 tires.
Performance axle ratios.
Zow!
The Buick Skylark
Gran Sport

Now! Everything you need in a delivery truck tire at passenger tire prices

Why pay more—or settle for passenger tires—when the Firestone Transport nylon tire offers you full truck tire strength and durability for your pick-up and light delivery trucks? Mileage? We made it with our exclusive, long-wearing Sup-R-Tuf rubber compounds. Traction? We designed it with a deep, gear-grip tread that'll *stop*—and go—even on slick pavements. What's more, we backed it up with a rugged Shock-Fortified nylon cord body that'll *keep* you going when the going gets rough. Firestone Transport truck tires are now on sale at your nearby Firestone Dealer or Store. At passenger tire prices.

Transport®, Sup-R-Tuf-Firestone T.M.

...so why not buy two?

Firestone

TRANSPORT NYLON TRUCK TIRE

POPULAR MECHANICS®

MAY 1965
VOL. 123 NO. 5

575 LEXINGTON AVE.
NEW YORK, N.Y. 10022

INTERNATIONAL EDITIONS • AUSTRALIAN • SPANISH • CARIBBEAN • FRENCH • DUTCH

Features of Special Interest

Who Will Win at Indy? A. J. Foyt, Rodger Ward and Parnelli Jones Preview This Year's Race . . . 73
Unmasking Mars: What Our Flyby Will Show . . . 78
Inside Our Fabulous Pivot-Wing Jet . . . 84
How Owners Rate Their 1965 Corvairs . . . 89
One-Year Test of Corfam Shoes . . . 94
Could You Toss the Caber? . . . 96
I Flew with the Iceberg Chasers . . . 100
Buying a House That Won't Fall Down . . . 110

26 Pages of Camping Fun

What's New for the Outdoors . . . 116
New Ways You Can Cook Afloat . . . 121
Which Picnic Cooler Is Best for You? . . . 125
Custom Tents from Parachutes . . . 128
Going Camping? Don't Forget Your Mousetrap . . . 131
Chuck Wagon Trailer . . . 132
Kinks for Campers . . . 138
Folding Kitchen for Station Wagons . . . 139

For the Workshop Craftsman

Preschooler's Desk Stores in Chair . . . 142
Aeolian Wind Harp . . . 144
Building *PM*'s Patio-Garage, Part II . . . 146
New Tricks for Drywall Remodeling, Part II . . . 154
Those Overlooked Auto Lube Jobs, Part I . . . 160
Make Your Own Patio-Yard Lights . . . 165
Sidewalk Surfboard . . . 166
Underwater Case for Movie Cameras . . . 169
Versatile "Nutcracker" Knurler for Your Shop . . . 175
Troubleshooting Your Outboard's Cooling System . . . 180
Installing an All-Channel Fringe-Area Antenna . . . 184

Regular Departments

Over the Editor's Desk . . . 6
Science Worldwide . . . 10
News from the Services . . . 28
Sidelights on Aviation . . . 35
Take Charge of Your Career . . . 36
Clinic for Homeowners . . . 40
Noteworthy New Inventions . . . 42
Spotlight on Sunbeam's Tiger . . . 44
New on the Market . . . 48
Items from All Outdoors . . . 50
Detroit Listening Post . . . 83
Auto Clinic . . . 164
Shopping for Tools . . . 174
Solving Home Problems . . . 180
Outboard Clinic . . . 183
Electronic Kinks . . . 188

***NEXT MONTH:** The vacation gold-rush* is on, and June PM tells you how to join the nugget hunters. There's an owners' evaluation of pickup campers; a PM rundown on car air conditioners; a startling piece on our new inland missile range, a remarkable new crop forecaster and a variety of plans for building treehouses for junior

PORTUGUESE • DANISH • SWEDISH

DON DINWIDDIE
Editor

RICHARD E. DEEMS
President, Mag. Div.

JOSEPH F. KERN
Publisher

WALTER IAN FISCHMAN
Editorial Director

RICHARD F. DEMPEWOLFF
Executive Editor

JOHN A. LINKLETTER
Managing Editor

Published by Hearst Corp., *RICHARD E. BERLIN, Pres.*

WAYNE C. LECKEY . . *Shop Crafts Managing Editor*
CLIFFORD B. HICKS . . . . . *Midwest Editor*
THOMAS E. STIMSON . . . . . *Western Editor*
HENRY NEHRBASS . . . . . *Art Director*
KEVIN V. BROWN . . . . . *Aviation Editor*
ED NELSON . . . . . *Automotive Editor*
ALFRED W. LEES . . . . . *Home Workshop Editor*
ARTHUR MIKESELL . . . . . *Boating Editor*
JOHN F. PEARSON . . . . . *Science Editor*
STUART JAMES . . . . . *Outdoors Editor*
LARRY STECKLER . . . . . *Electronics Editor*
ARTHUR J. MAHER . . . *Home and Garden Editor*
ALEX MARKOVICH . . . . . *Associate Auto Editor*
FRANK X. SMITH . . . . . *Production Editor*
ROBERT B. BERGER . . . . . *Associate Editor*
MURRAY COOPER . . . . . *Art Editor*
LEO R. WEEKS . . . . . *Assistant Art Director*
FRANK P. FRITZ . . . . . *Chief Photographer*
GARRY WINTER . . . . . *Book Editor*
FRANKLYN JACOBY, ASID/IDI . *Design Consultant*

ADDRESS COMMUNICATIONS TO: 575 Lexington Ave., New York, N.Y. 10022. For additional sources of information on the articles and products in this issue, write to Bureau of Information, *Popular Mechanics*, for free "Where-to-Find-It" List.

L. PARK BENJAMIN, *Advertising Director*

ADVERTISING OFFICES: New York: 575 Lexington Ave., MUrray Hill 8-8500; Chicago: 520 N. Michigan Ave., 527-2400; Detroit: General Motors Bldg., TRinity 5-8711; Cleveland: Hanna Bldg., 1422 Euclid Ave., PRospect 1-0456; Los Angeles: 3460 Wilshire Blvd., DUnkirk 2-8458; San Francisco: 1101 Hearst Bldg., YUkon 2-0823.

SUBSCRIPTION SERVICE: Mail all subscription orders, changes of address, correspondence concerning subscriptions, and Postmaster notices of undeliverable copies to *Popular Mechanics*, 250 West 55th St., New York, N.Y. 10019.

Popular Mechanics is published monthly by **The Hearst Corporation**, 57th St. at 8th Ave., New York, N.Y. 10019, U.S.A. Richard E. Berlin, President; George Hearst, V-Pres.; Richard E. Deems, President of Magazines; John R. Miller, V-Pres. & Gen. Mgr. of Magazines; G. Harry Chamberlaine, V-Pres. for Research and Marketing; William S. Campbell, V-Pres. and Director of Circulation; Joseph F. Kern, V-Pres. for **Popular Mechanics**; Frank Massi, Treasurer; R. F. McCauley, Sec'y. Single copy in the United States and Canada, 35 cents. Subscription prices: United States and Possessions, $4.00 for one year; $7.00 for two years; $10.00 for three years. Canada, add $0.50 for each year. Pan American Postal Union countries, add $1.00 for each year. All other countries, add $2.00 for each year. **When changing address, give old address as well as new address. Allow four weeks for change to become effective.** Second class postage paid at New York, N.Y., and at additional mailing offices. Authorized as second class mail by the Post Office Department, Ottawa, and for payment of postage in cash. Registered as Second Class matter at the Post Office at Mexico, D.F., Mexico, June 20, 1950.

©1965 by The Hearst Corporation. All rights reserved. Printed in U.S.A.

"WIN THE PACE CAR IN MONROE'S 'INDY SPECIAL' CONTEST"

—says Sam Hanks, Indianapolis "500" champion and driving safety expert.

Here's all you do: Stop in at a dealer displaying the yellow and blue Monroe Indy Special banner. Ask for a free shock absorber test. While there, fill out the "Indy 500 Special" contest entry, estimating the speed of the winning car at this year's Indianapolis "500".

If you're the winner, you'll receive a Plymouth Sport Fury, the 1965 pace car. Over 150 other prizes, too!

Drive in for your free shock absorber test and ask for an entry blank today. Contest closes May 14, 1965.

Void in states where prohibited by law.

MONROE®

World leader on highway and speedway

MONROE AUTO EQUIPMENT COMPANY • Monroe, Mich.

Over the Editor's Desk

Glider Flight—40 Years Ago

You took me back 40 years when you printed the picture of the original *PM* glider in the January column, *Sidelights on Aviation* (page 26).

It was about 40 years ago that 12 of us—aged 10 to 14 years—built the glider out of bamboo fishing rods and muslin. We stiffened the muslin with rosin and gum arabic.

On one beautiful kite-flying day, we launched the glider by running into the wind. As I remember, we were able to get about 40 feet off the ground and travel about 200 feet.

In about a week, someone got the idea of running off the flat roof of a soap factory. We waited for a suitable Sunday when no one could catch us.

We drew straws to see who would go first. The boy got into it, and with the rest assisting ran off the roof. The soap factory had a tall chimney that was pumping out volumes of smoke, and he was caught in the updraft. I don't know how high he got, but to a 12-year-old it was a mile.

He had the presence of mind to head for the Wabash River. He went in with a mighty splash, and was hauled out wet and scared. The last we saw of the glider, it was floating down the Wabash.

That evening, ours was a group of chastened boys with very warm bottoms.

Our second glider four years later was of better construction and launched with rubber inner tubes.

Yes, out of the gang of a dozen, five are pilots or are otherwise connected with aviation.

Lafayette, Ind. A. L. McDowell

Thanks for sharing this delightful story of your first venture into aviation, Reader McDowell.

Do-It-Yourself Fire Truck

We've used this converted weapons carrier as a fire truck for a year and are very proud of its performance.

The conversion was done in my garage on my farm—mostly from about 3 a.m. until morning chore time. I stripped an old fire truck to get the water pump and other special parts.

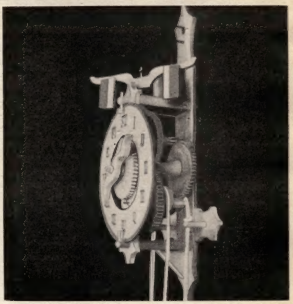
Now we (the South Vienna-Harmony Township Fire Department) have a fire

truck that can go across fields that other trucks can't cross to fight fires. It has a sprayer on the front that allows it to be driven through a grass fire, spraying the ground in front. A pressure hose on top throws a 100-foot stream of water.

South Charleston, Ohio Lowell Baldwin

Respects Old-Timers

Your clock project (*Early Swiss Wooden-Wheel Clock*, page 156, August *PM*) proved to be very interesting, and it furthered my respect for the early-day clockmakers.



It is also a challenge to present-day craftsmen, I might add.

I built two of the clocks—the first of mahogany (which proved to be too moisture absorbent) and the second of cherry.

Wickenburg, Ariz. Loren V. Stone

Two Feet Longer

My two sons (5 and 7 years old) and I built the *Hydro Dynamic* (page 144, March 1963 *PM*).

The hull is 15 feet, 11 inches long—which is longer than the original. Because of the extra 2 feet, I had room to put in back-to-

(Please turn to page 8)

Your study is illustrated with actual legal cases like these:

CONTRACTS Jensen wrote to Stone making an offer. Stone wrote his acceptance and mailed it. Then he decided to call it off and telegraphed Jensen to that effect. Jensen got the telegram before he received the letter. **Can he hold Stone to the contract?**

TRESPASS Gray sold Lewis an automobile which, at the time, was in Gray's garage, and told Lewis he could take it away any time within the next week. The following day, he notified Lewis to keep off his property. Nevertheless, Lewis went to Gray's garage and took the automobile. **Is Lewis liable for trespassing?**

CRIMINAL LAW Dane asked Ellis to lend him a dollar. Ellis gave him what they both supposed was a one-dollar bill. Dane later discovered that it was a ten-dollar bill, and he kept it for his own. **Is he guilty of larceny?**

SALES Hill made an offer to James, a farmer, of $17 a ton for all the hay in his barns. James accepted the offer. The same night, the barns and all their contents were destroyed by fire. **Who bears the loss of the hay?**

TORTS Lloyd was a sales representative, and a very valuable man, employed by a leading company. He conceived a grudge against one of the company's bookkeepers, and threatened to leave the company unless the bookkeeper was discharged. Rather than lose Lloyd, the company fired the bookkeeper although it had no objection to him or his work. **Has the bookkeeper a right of action against Lloyd?**

PARTNERSHIPS Johnson and Mahon are partners in the hardware business. Johnson orders a small delivery truck from a local auto dealer. However, the hardware firm is engaged exclusively in a mail order business, selling only to out-of-town customers, and has no use for a delivery truck. **Is the partnership liable for the price of the truck?**

GOVERNMENT A city raises money by a tax on all real property in the city, then uses the money to build a public golf course in one extreme corner of the municipality where it is practically inaccessible to most of the citizens. **Will this action be legally upheld?**

DECEIT An insurance agent, in order to induce a man to take out a policy, told him that certain prominent men were members of the insurance company's board of directors. The policy was purchased because of that statement. In fact, the men were not directors of the company. The insured man could have discovered this by consulting public corporation records at the state capitol. **May he maintain an action for deceit?**

Your LaSalle training covers the decisions in these and over 2,000 other actual cases which illustrate vital principles of law.

Study law at home...by LaSalle's famed case method

THOUSANDS OF BUSINESS AND PROFESSIONAL PEOPLE ADVANCE THEMSELVES THIS INTERESTING WAY

A law education is now regarded as indispensable equipment for anyone who aspires to a position of leadership in the business world. Each year, the LaSalle Law School enrolls thousands of men and women seeking greater success in business, along with the recognition and prestige that a law background can bring. These enterprising people gain their law training *at home*, in spare hours, without loss of time or income from regular pursuits. They find LaSalle home study convenient, thorough and fascinating.

Law library (included in course) presents actual cases

LaSalle's law course is an absorbing review of actual cases — over 2,000 of them that vividly illustrate fundamental principles of American law. The basis of instruction is the handsomely bound 14-volume LaSalle Law Library which is given to you as part of the program.

Whatever your present position—whatever your previous schooling —you can multiply your opportunities for rapid promotion, big income and increased prestige through modern LaSalle law training.

Earn an LL.B. degree from LaSalle

You can master law easily and enjoyably at home — at remarkably low cost—under the supervision of LaSalle's distinguished law faculty. Instruction is practical, up-to-date, individual. If you qualify, upon completion of your training you are awarded a Bachelor of Laws degree.

Mail the coupon for free booklet

If you are determined to get ahead in business — if you want to see how LaSalle's training can help you increase your income and elevate your position in life—send for LaSalle's famous booklet, "Law Training for Leadership." It is free. Mail the coupon to LaSalle, 417 South Dearborn, Chicago, Illinois 60605.

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 South Dearborn St., Dept.41-044, Chicago, Illinois 60605

Please mail me, free of cost or obligation, your fully illustrated booklet "Law Training for Leadership."

Name.....Age.....

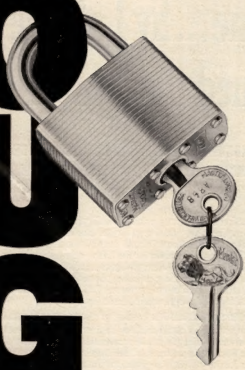
Address.....County.....

City & State.....Zone or Zip No.....

Occupation.....Working Hours.....A.M.....P.M.

Canadian residents, write: LaSalle, Box 1001, Montreal 3, Quebec 247

TOUGH



Toughness is engineered into every MASTER Padlock — from the laminated steel case to the hardened steel shackle. This is no ordinary padlock . . . it's the strongest in the world! So get a MASTER and get the best. $1.50 to $4.00 in a variety of styles and sizes, at your hardware store or locksmith. Also available in sets keyed-alike (with interchangeable keys) or master-keyed. If it's worth locking up, it's worth a MASTER Padlock!

Master

WORLD'S STRONGEST PADLOCKS

Over the Editor's Desk

(Continued from page 6)

back seats which fold down to make two berths for overnight camping.

The boat is powered by a 45-hp engine, and performs very well.

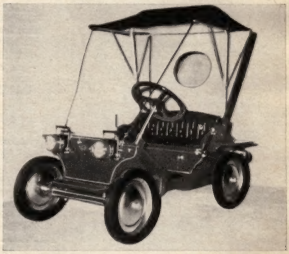
Thank you for the good boat plans you have in *PM*.

Westminster, Calif. BERT ANDERSON

What Kind Is It?

The response of people has been very gratifying toward the *Sidewalk Classic* (page 146, November 1963 *PM*) that I built for my children.

However, when they ask what kind of a car it is modeled after, I am at a loss to



answer. Some information about the year and the model would be appreciated.

North Providence, R.I. N. T. LEPORE

It's really not modeled after one particular car. Designer Bob Woolson simply took the lines from several old-time autos and incorporated them into the Sidewalk Classic. (And rather successfully, too, judging from the number of letters and pictures we've received from pleased builders.)

The Editors

WHY HAS I.C.S. STAYED ON TOP FOR 75 YEARS?

BECAUSE ITS COURSES HELP PEOPLE MAKE MORE MONEY

ARCHITECTURE and BUILDING
Architecture
Arch. Drawing
Carpentry & Millwork
Plumbing & Heating

ART and DESIGN
Commercial Art
Interior Decorating
Sign Painting
Sketching & Painting

AUTOMOTIVE
Auto Electrical Tech.
Automotive Mechanic
Transmission Specialist

BUSINESS
Accounting
Bus. Administration
Executive Training
Marketing
Programming for Digital Computers
Purchasing Agent
Salesmanship
Small Business Mgmt.
Traffic Mgmt.

CHEMICAL
Chem. Engineering
General Chemistry
Nuclear Energy
Plastics
Pulp, Paper

CIVIL ENG.
Civil Engineering
Highway Engineering
Structural Blueprints
Sanitary Engineering
Surveying & Mapping

DRAFTING
Architectural
Electrical & Electronic
Mechanical

ELECTRICAL
Appliance Servicing
Electrical Engineering
Elec. Motor Repairman
Instrument Technician
Practical Electrician
Electronics Technician

ELECTRONICS
Industrial Electronics

ENGINEERING (Professional)
Chemical Civil
Electrical Mech.

ENGLISH and WRITING
Better Business Writing
Free Lance Writing
Short Story Writing
Practical English

HIGH SCHOOL
High School Business
High School General
High School Secretarial
High School Vocational
College Preparatory

MECH. & SHOP
Air Conditioning
Industrial Engineering
Instrumentation
Machine Design
Machine Shop Practice
Mechanical Engineering
Shop Prints
Refrigeration
Toolmaking
Safety Engineering
Welding

SECRETARIAL
Legal Medical
Stenographic Typist

STEAM & DIESEL POWER
Boiler Inspector
Power Plant Engineering

SUPERVISION
Foremanship—Supervr'n Personnel—Lab. Rel'ns

TV-RADIO
Radio and TV Servicing
Radio-Telephone License

MISCELLANEOUS
Textile
Languages by Berlitz

THE I.C.S. SUCCESS PLAN CAN WORK FOR YOU, TOO! Take your first big step to real success. Clip the coupon and mail it NOW! I.C.S., Scranton, Penna. 18515. More than 7,000,000 students since 1890. Accredited Member, National Home Study Council.

ICS INTERNATIONAL CORRESPONDENCE SCHOOLS Dept. 704, Scranton, Penna. 18515

(In Hawaii: P.O. Box 418, Honolulu. In Canada: I.C.S. Canadian, Ltd., Montreal.) Rush me, FREE, "HOW to SUCCEED," the opportunity booklet about the field I have indicated below, and a sample lesson. New! Special Package for Women!

Name of the course in which you are interested _____

Mr.
Miss _____ Age _____ Address _____
Mrs.

City _____ State _____ Zip Code _____ Working Hours _____ A.M. to _____ P.M.

Occupation _____ Employed by _____

Low rates to members of U. S. Armed Forces!
Special training programs for industry

Milk guaranteed not to sour for six months or more is being marketed by a large British dairy company. The "secret ingredient" is very high heat.

Milk is passed over steam-heated plates, quickly bringing it up to 270 degrees F., more than 100 degrees higher than temperatures used in ordinary pasteurization processes. It's then put into sterile, plastic-coated cartons.

In flavor, the milk is reported to be "virtually indistinguishable" from the usual pasteurized product. Because of marketing regulations, the milk has yet to be sold in Britain. But the company has been exporting it and selling it to steamship lines.

Satellites have finally enabled science to pinpoint the exact location of Bermuda —over 400 years after its discovery. By sighting the Echo I and II satellites against their star background, the Coast and Geodetic Survey has placed Bermuda 220 feet north and 105 feet west of the location determined by the Air Force in 1959.

A lunar "sea" has been found on earth. It's a 37-by-17 mile area near Sudbury, Ont., that was created in the same manner as a *mare* on the moon—by the impact of a large meteor, which melted rock and caused lava to flow.

The collision took place about 1.7 billion years ago, it's estimated, and it produced energy equal to the explosion of seven million megatons of TNT. By comparison, the largest hydrogen bombs are rated at less than 100 megatons.

The smooth, bowl-like depression is the site of a $500-million-a-year Canadian nickel mining operation.

Don't underestimate the inner strength of the poet and dreamer. That's one conclusion that can be drawn from the results of a recent New York University study of the effects of isolation on human beings. Subjects spent from four to 72 hours in a soundless room, with vision cut off and movement restricted.

"The Jack Armstrong, athletic, square-jawed type" tended to go to pieces when cut off from his normal environment, report the psychologists who directed the study. The "poet" type, the more imaginative and introspective person, showed much more stability.

Ten words will enable an astronaut outside of his spaceship to control his personal rocket pack; the pack will contain gas under pressure and nozzles to spurt it in different directions. Because the astronaut will be using tools (coupling space stations, making repairs), his hands won't be free to push buttons or work levers. So U.S. space engineers have developed a device that converts the sound of a spoken word into an electronic signal. It's thought that 10 such signals would be needed to steer a rocket pack.

Oranges can now be stored for as long as eight months. After being harvested, the oranges are put in a cold, low-oxygen atmosphere that prevents respiration of the fruit and so retards spoilage. So says the developer of the new system, one of our large appliance manufacturers.

Shrink the earth by about 45 percent in volume and South America would fit snugly against Africa, like two pieces of a picture puzzle. North America, Greenland and Europe would match up, too.

This fact has long given rise to scientific speculations. A recent one, by British physicist K. M. Creer, ties in with a theory of an expanding earth. If, says the scientist, the earth was once about 55 percent its present size and wholly covered by land, and if it then ballooned to its present size, the broken pieces of land mass would have shaped up just about the way they are now. Source of the tremendous energy needed to have caused this, however, is a mystery.

Laundered oil is big business. The industry came into being after the National Bureau of Standards determined that crankcase oil doesn't wear out; it only gets dirty. Today, member firms of the Association of Petroleum Re-refiners turn out some 400 million quarts of reprocessed oil a year. Some sports-car buffs prefer it, regarding it as a purer oil than the original product. In reprocessing, the oil is cleaned chemically and put through special filters.

Bidrin, a chemical that's injected into elm trees to poison the bark-eating elm

(Please turn to page 12)

Take Security and Top Pay For Granted! Get into REFRIGERATION, AIR CONDITIONING and HEATING

Learn RIGHT AT HOME in your SPARE TIME!

YOU LEARN BY DOING!
You Build This Complete Refrigeration System YOURSELF!

Learn as you build . . . practice with 25 kits of parts and tools (all included with the course). Follow the easy instructions and, in just a short time, you build a complete refrigeration system that you can convert into an air-conditioner, freezer or refrigerator!

Mail the Coupon below and we'll rush you—absolutely FREE—a valuable book of facts about the big, top-paying job opportunities in the booming field of refrigeration, air conditioning and heating.

This promising business is now a multi-billion dollar industry that's demanding more than 20,000 NEW mechanics every year—jobs that offer good money and real security.

Learn at Home in Your Spare Time

Everything you need to become a skilled specialist in refrigeration, air conditioning and heating will be sent to you. You can study without leaving home, and without giving up your present job. Trained instructors stand by to help you when you need it.

A BETTER JOB—A Business of Your Own!

As you read your Free Book, you'll see how many graduates now operate profitable businesses of their own. Many take high-paying jobs with dealers, distributors or contractors. Many use their new skills as a source of extra part-time income. The choice is up to you.

Thousands Find Success and Security

"I helped install 175 tons of equipment in a shopping center; 3 central AC and heating units in new homes; and 17 room units. Not bad for a student."—James Voss, Tex. "Your course opened a new world of opportunity. I have 3 job offers to choose from."—Thomas O'Connor, New York. "I've earned $400 more than I paid for the course. Am now self-employed."—James Rosado, S. Car. (You'll find many more letters like these in your Free Book.)

AND STILL MORE OPPORTUNITIES IN . . .

Auto Mechanics! Free 32-page book, "Make Big Money in Auto Mechanics." Easy to read.

Television Servicing! Free 20-page book, "You and Your Future in Color Television."

Building Construction! Free 30-page book, "Your Future in Building Construction."

Industrial Electronics! Free 20-page book tells you how to get started, how to keep going.

If coupon has been removed, write to:
COMMERCIAL TRADES INSTITUTE Chicago, Illinois 60626

ACT NOW—MAIL THIS COUPON AT ONCE —NO OBLIGATION

COMMERCIAL TRADES INSTITUTE
1400 Greenleaf Avenue
Chicago, Illinois 60626 Department R-392

FREE! No Obligation

Check one

☐ Rush me your FREE Book, "Be a Success in Air Conditioning, Refrigeration and Heating" and Sample Lesson
☐ Free Auto Mechanics Book ☐ Free Industrial Electronics Book
☐ Free Television Servicing Book ☐ Free Building Construction Book (Black-&-White & Color)

NAME_____ AGE_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____

Accredited Member National Home Study Council

Science Worldwide

(Continued from page 10)

beetle, has been approved by the Department of Agriculture for use by professionals; it's too toxic to be sold to the public. Killing the beetle is effective because the insect carries, from tree to tree, the fungus that causes the disease. But if you read the April, 1964, issue of *PM*, none of this is news to you. Fighting Dutch elm disease with Bidrin was described in an article called *We Can Save Our Elms* (page 122).

The meteorological climate in Washington has been a changeable affair during the last 100,000 years. Right under the White House (where the political climate changes often enough) are the remains of a swamp where Labrador-type trees grew some 70,000 years ago.

Grains of pollen identify the trees and radioactive carbon dating tells when they grew, according to the U.S. Geological Survey. It was cold along the Potomac then, although the glaciers didn't get quite that far south. A few thousand years earlier, there were warm-country cypress swamps. And a few thousand years after the long cold snap, it was again much warmer than now.

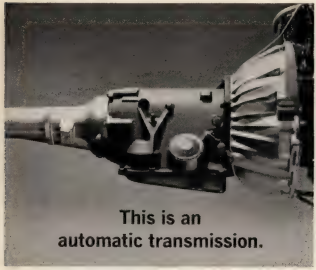
A shrimp's world is mostly blue. That fact was recently established by a scientist at the Scripps Institution in California. A lobster, on the other hand, sees green. The researcher pinpointed these colors by isolating light-sensitive pigments in the eyes of the sea creatures.

Is there life on Mars? That question has long intrigued scientists, among them Judie Herr, a science fair winner and freshman at Florida State. She has spent six years probing it.

Judie took a common moss and painstakingly made it adapt to a "Martian" climate. She introduced minute changes in the nitrogen and moisture content in the flask containing the plant until it was living in an atmosphere similar to that thought to exist on Mars.

This summer Judie and other scientists interested in Mars may be able to check the results of their experiments against brand-new findings sent back to us by Mariner IV. This ambitious space investigation is described in *Unmasking Mars: What Our Flyby Will Show*. You'll find it on page 78 of this issue.

(Please turn to page 16)



It's a $200 or more "extra" in most new cars.

This keeps it working like new for $1.95.

Your automatic transmission represents an extra investment in your car. Protect that investment—and get peak transmission performance—with Quaker State ATA. This special additive does more than just restore transmission fluid level. It reduces future fluid loss by swelling hardened transmission seals. Quaker State ATA also insures "like new" smooth shifting, and prevents sludge and varnish deposits from forming. Make sure you get full returns on your investment in your automatic transmission. Ask your service man to add a can of Quaker State ATA to your transmission fluid.

QUAKER STATE OIL REFINING CORP.
Oil City, Pennsylvania

ATA is made by the makers of

SHOP HERE FOR

BUSINESS KNOW-HOW

...THE NEW, EASY PROGRAMED WAY

It's never been truer. You need KNOWLEDGE to move ahead in business. The kind employers look for when filling their top positions. Know-how worth money in your pocket.

You now can get this job-related knowledge easily, economically. New on the market—a series of "programed" Business study units . . . and a new list of definitive executive textbooks . . . with the know-how you need to move ahead faster in business.

15 NEW STUDY UNITS

These study units are in a class by themselves. Each is a complete work on its subject, and consists of a textbook and . . . a "programed" Study Guide, with hundreds of questions and answers on text material. Read the text, answer the questions. Tough points come clear. You really learn your subject.

These units are available now at a basic price of $4.95 each (special package prices for unit groups). Early orders will receive FREE vinyl case for each Study Guide.

B1-B3 PRINCIPLES OF CREATIVE SALESMANSHIP. Part 1 (B1): Selling at retail, wholesale & manufacturing levels; product knowledge; the 5 basic buying motives. Part 2 (B2): Finding, qualifying prospects; pre-approach; interview; sales talk. Part 3 (B3): Completing the sale; handling objections; trial closing; analyzing the sale. (3 Salesmanship units—$12.95.)

B4 SELLING YOUR IDEAS: Presenting & winning approval for your ideas; selling yourself; getting along with people.

B5-B6 HOW TO BE A GOOD EXECUTIVE. Part 1 (B5): The executive mind; executive development; physical fitness for executives. Part 2 (B6): Handling people; holding conferences; the executive code. (Both units $8.95.)

B7-B9 THE EXECUTIVE USE OF ACCOUNTING. Part 1 (B7): Bookkeeping & accounting distinguished; debit, credit theory; journals, statements, ledgers. Part 2 (B8): Analyzing records; inventory analysis; depreciation; prepaid expenses; deferred charges; ratios. Part 3 (B9): Cash proceeds; budgeting; estimating balance sheets; estimating costs, sales; capital budget; replacement costs of fixed assets. (3 Accounting units—$12.95.)

B10-B11 PUBLIC RELATIONS. Part 1 (B10): Business & public relations; case histories; costs of PR. Part 2 (B11): PR techniques, policies; trade, customer relations; PR career. (Both units $8.95.)

B12-B15 USEFUL ENGLISH. Part 1 (B12): The 8 parts of speech. Part 2 (B13): Modern usage; recognizing and overcoming common errors Part 3 (B14): Spelling and how to master it; vocabulary building. Part 4 (B15): Sentences and paragraphs; grammar; construction; capitalization and punctuation. (4 English units $16.95.)

COMING: Texts and Study Guides for these additional subjects: Inventory Control, Purchasing, Work Measurement, Marketing Research, Office Analysis, Indexing and Filing, Typewriting. For information: check the coupon below.

11 NEW EXECUTIVE TEXTBOOKS

These vital Business and Technical texts are virtually the latest word in their fields. Many used in graduate school courses. Knowledge businessmen, engineers need. Written by experts. Beautifully bound for study and reference.

T1—*Our Economy* (324 pp) $5.75. T2—*Production Analysis & Control* (863 pp) $9.50. T3—*Technical Communications* (306 pp) $6. T4—*Practical Report Writing* (120 pp) $2. T5—*Introductory Accounting* (761 pp) $7.25. T6—*Accounting Systems* (577 pp) $7.75. T7—*Marketing Models* (671 pp) $7.75. T8—*Organizational Behavior & Management* (741 pp) $7.75. T9—*Readings in Financial Management* (494 pp) $6.50. T10—*Basic Statistical Methods* (325 pp) $8.50. T11—*Analog & Digital Computer Methods* (457 pp) $9.25.

These textbooks and Business study units have it—the know-how you need to move ahead in business. Get started right now. Fill in the coupon and mail it. Your first step to know-how worth money in your pocket. DON'T DELAY. Send in your order NOW!

CLIP COUPON HERE . . . 15-DAY MONEY-BACK GUARANTEE IF NOT SATISFIED

INTERNATIONAL EDUCATIONAL SERVICES, INC. Dept. 835, Scranton, Penna. 18515

Send me, postpaid, the Business study units circled below at $4.95 each ($8.95 for B5-B6 or B10-B11; $12.95 for B1-B3 or B7-B9; $16.95 for B12-B15).

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15

Send me the Executive Texts indicated, at prices listed above.

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11

☐ I enclose check (money order) for_____to cover full amount.

☐ Send items C.O.D. I will pay postage.

Name_____Age_____

Address_____

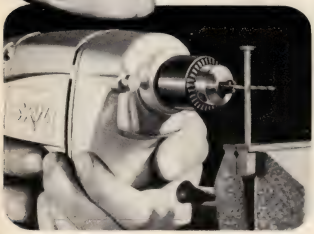
City_____State_____Zip Code_____

Occupation_____

☐ Send me information on new Business study units.

The green trigger identifies the greatest advance in electric drills in 50 years!

Exclusive! New! Skil



HOLE IN NAIL DEMONSTRATES THE AMAZING CONTROL OF NEW SKIL DRILL. We did it with the ¼″ Skil Trigger Speed Control (TSC) Drill. TSC drills also available in ⅜″ and ½″ sizes.

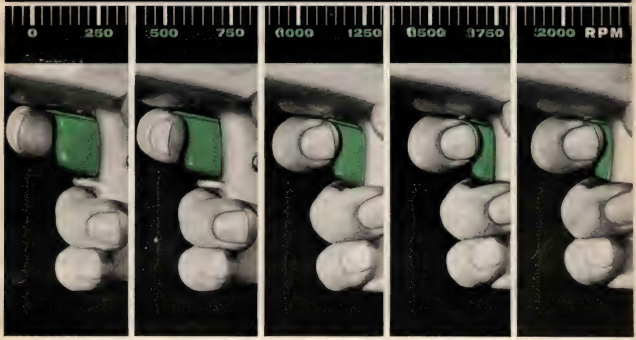
A PRECISION DRIVER, TOO! With the versatile Skil Trigger Speed Control Drill the variable speed feature lets you start screw at low speed, run it down at high speed, set it by slowing to a stop.

Go with the pick of the pros... SKIL POWER TOOLS

Skil Corporation, 5033 Elston Ave., Chicago, Illinois 60630

SQUEEZE THE DRILL SPEED YOU NEED

With Trigger Speed Control you actually sense the correct speed with your trigger finger—much as you sense your car's speed with your foot on the accelerator.



Trigger Speed Control Drill

For the first time, you regulate speeds, from 0 to 2,000 rpm's, with your trigger finger

TO MATCH THE MATERIAL

You get stepless speed control to drill plastics, composition materials, wood or metal by varying finger pressure. No buttons or dials to fool with.

TO DRILL HOLES IN METAL WITHOUT CENTER PUNCHING

Start with light trigger pressure which keeps rpm low, makes bit placing easy—even on convex surfaces.

TO DRIVE SCREWS TO EXACT DEPTH

Exchange drill bit for driver bit, drive screws to exact depth you want. Even drive self-tapping metal screws—without center punching.

SEE NEW SKIL TSC DRILLS AT BETTER DEPARTMENT, HARDWARE AND LUMBER STORES EVERYWHERE

AUTOMOTIVE

RADIO-TV

MAINTENANCE

WORKSHOP

UNUSUAL BARGAINS

"$6 A YEAR FOR FUEL HEATS HOUSE, POOL"
SEE FEBT. ART. FEB. POPULAR MECHANICS
Build Actual Working Model
NEW SOLAR HOUSE KIT
Exact Replica of F.H.A. Approved Home

Heat your house for $6 a year? The day may come. Four houses now heated by patented Solar Heat unit which harnesses the sun's rays. Investigate this new money-saving vital-energy principle and have fun for the whole family at the same time. All you need to harness the sun is this kit and a small supply of lumber, stone and insulating material. Complete house 19" x 16" x 15". Kit incl.: 2 thermometers, step-down transformer, fan, minature motor, screen for heat collecting bin, plastic sheets, copper pipe, plastic tubing, electric water pump, water connections, metal reflector roof, assorted parts. Book, "Solar House Models" written by the inventor gives complete details.
Stock No. 70-705-H ..... **$24.50 Postpaid**

Bargain! 3" Astronomical Telescope

See the stars, moon, phases of Venus, planets close up! 60 to 180 power—famous Mt. Palomar Reflecting type. Unusual Buy! Equipped with Equatorial mount, finder telescope, hardwood tripod. Included FREE: "STAR CHART"; 272-page "HANDBOOK OF HEAVENS"; "HOW TO USE YOUR TELESCOPE" book
Stock No. 85,050-H ..... **$29.95 ppd.**
4½" Reflecting Telescope—up to 255 Power, All-metal pedestal mount. Stock No. 85,105-H.. $79.50 F.O.B.

MINIATURE WATER PUMP

Wonderful for experiments, miniature waterfalls, fountains. HO gauge railroad backdrops, etc. Tiny (5⅝" x 1⅜") electric motor and pump ideal for hobbyists, labs, schools. Pump continuous flow of water at rate of one pint per minute at a 12" head. With 2 D Batteries in series will pump to 20" head. Runs 48 hrs. on battery. Works in either direction. Self-priming. **Stock No. 50,345-H** ..... **$2.25 Postpaid**

WAR SURPLUS AMERICAN-MADE 7x50 BINOCULARS

Big savings! Brand new! Crystal clear viewing —7 power. Every optical element is coated. An excellent night glass—the size recommended for satellite viewing. Individual eye focus. Exit pupil 7mm. Approx. field at 1,000 yds. is 376 ft. Carrying case included. American 7 x 50's normally cost $274.50. Our war surplus price saves you real money.
Stock No. 1544-H ..Only $74.80 Ppd. (tax incl.)
6 x 30 Binoculars—similar to above.
Stock No. 983-H...$33.00 Postpaid (tax incl.)
7 x 35 American made Binoculars
Stock No. 964-H .....$60.50 Ppd. (tax incl.)

SOLVE PROBLEMS! TELL FORTUNES! PLAY GAMES!
NEW WORKING MODEL DIGITAL COMPUTER
ACTUAL MINIATURE VERSION OF GIANT ELECTRONIC BRAINS

Fascinating new see-through model computer actually solves problems, teaches computer fundamentals. Adds, subtracts, multiplies, shifts, complements, carries, memorizes, counts, compares, sequences. Attractively colored, rigid plastic parts easily assembled. 12" x 3½" x 4¾". Incl. step-by-step assembly diagrams, 32-page instruction book covering computer language (binary system), programming, problems and 15 experiments.
Stock No. 70,683-H .....**$5.95 Ppd.**

OPAQUE PROJECTOR

Projects illustrations up to 3" x 3¼" and enlarges them to 38" x 50" screen in 5½ ft. from projector. Super picture is even better further away. Ideal for adult entertainment. Projects full color or black-and-white. Operates on 115 volt, A.C. current. 6-ft. extension cord and switch included. Operates on 60 watt bulb not included. Size 12" x 8" x 4½" wide. W. 1 lb., 2 oz. Plastic case. **Stock No. 70,199-H** .....**$7.95 Postpaid**

OPAQUE PROJECTOR WITH KALEIDOSCOPE ATTACHMENT—Same set as above, but provides endless additional projects with overchanging kaleidoscopic patterns. **Stock No. 70,714-H** .....**$10.00 Ppd.**

'FISH' WITH A WAR SURPLUS MAGNET
Go Treasure Hunting On The Bottom

Great idea! Fascinating fun and sometimes tremendously profitable! Tie a line to our 5-lb. Magnet—drop it overboard in bay, river, lake or ocean. Troll it along the bottom—your "treasure" haul can be outboard motors, anchors, fishing tackle, all kinds of metal valuables. 5-lb. Magnet is war surplus—Alnico V Type—Gov't. Cost—$50. Lifts over 125 lbs. on land—much greater weights under water. Order now and try this new sport!
Stock No. 70,571-H. 5 lb. Magnet .....**$12.50 Postpaid**
Stock No. 70,570-H. 3½ lb. Lifts 40 lbs. .....**$ 6.75 Postpaid**
STOCK NO. 85,152-H . . . (lifts over 250 lbs) .....**$33.60 F.O.B.**

Order by Stock No.—Send Check or M.O.—Money-Back Guarantee
EDMUND SCIENTIFIC CO., Barrington, New Jersey

MAIL COUPON FOR FREE CATALOG "H"

Completely new 1965 Edition, 148 pages. Nearly 4000 Bargains.
EDMUND SCIENTIFIC CO., Barrington, N. J.
Please rush Free Giant Catalog "H".
Name.....
Address.....
City.....Zone.....State.....

Science Worldwide

(Continued from page 12)

High-school students tend to think they're smarter than they actually are, according to a study recently completed by the Russell Sage Foundation. Girls tend to rate themselves less bright than boys, though they may be equal or better, and "in their negotiations with the opposite sex are careful to play down any intellectual challenge."

A big food producer—Thomas J. Lipton, Inc.—has confirmed that it is experimenting with the use of radiation to soften vegetables for its dehydrated soups. Main advantage would be cutting the cooking time from 10 minutes to one. For more information on irradiated foods, read *Wonderful World of Irradiated Miracles* (page 85 March '65 *PM*).

The ability to produce an exact copy of the atmosphere of the sun has come close to realization at the University of California.

Physicists there have invented an easily controlled method of heating up a quart volume of gas to the temperature of the sun's atmosphere. By adding a whiff of this and a whiff of that to the superheated gas, they hope to make the light it gives off match precisely that of the sun.

If the artificial light is a perfect match, under spectroscopic analysis, then they will figure their gas mix is the same as the sun's.

Special trousers that attach to the seat of a car offer good protection to a child. That's the claim of the Dutch safety expert who designed them. He says the pants permit the child to sit or stand, but prevent his being thrown forward in a head-on collision.

The secret of good mixing—whether you're working with paint, milkshakes or cake batter—is to tip the bowl or container. That way, says a professor of chemical engineering at Purdue University, you get vertical currents in addition to the usual circular stirring motion. The mixing will be done faster and with less effort.

To blend coffee, cream and sugar faster, according to the Purdue scientist, you should move the spoon back and forth across the cup instead of round and round.

John F. Pearson
Science Editor

Do's and Don'ts for Do-it-yourself Painters

PITTSBURGH® PAINTS

PITTSBURGH PLATE GLASS COMPANY
Pittsburgh, Pennsylvania

Tear out and keep for guidance when painting

Hints to give you the best possible exterior paint job

Don't use "bargain sale" paint. Remember that if you *hire* a painting job done, the materials will represent only about 1/5 of the total cost. So if you're going to do the work yourself, why put all that effort into applying anything but the best product—good Pittsburgh house paints.

Do mix well and follow thinning and application instructions.

Don't try to save money by thinning more than recommended—you'll shorten the life of paint.

Do prepare surface. For a lasting paint job, it is important to prepare the surface properly before painting. Mainly, this means cleaning the surface and removing loose paint so that the new paint adheres tightly to a sound surface. Use a wire brush, scraper or putty-knife to remove blistered or scaly paint. If old paint is badly stained, clean it with a solution of one-half pound of trisodium phosphate to a gallon of water.

Don't leave clapboards loose. Nail down, then fill holes with putty. Where necessary, recaulk joints around chimneys, doors and window frames. Replace all cracked or loose window sash putty.

Do use the right paint. If the painted surfaces are in sound condition—you're in luck! You can cut your time, work and expense practically in half by using Pittsburgh SUN-PROOF® Latex. It requires *no primer* on sound, painted surfaces. Think how much shorter this can make your entire painting job! **And, you save even more** time because there's no waiting for damp surfaces to dry; you can paint right over morning dew or right after rain. And because SUN-PROOF Latex dries in about a half hour, bugs and dust just can't mar your work. Pittsburgh SUN-PROOF comes in a wide range of fresh, beautiful colors that flatter any home. To clean up your tools after painting, just rinse in warm, soapy water.

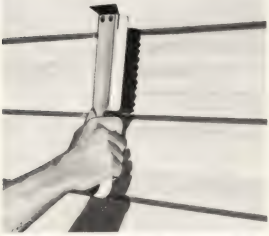
If you desire an oil base paint, use SUN-PROOF® House Paint. Special oils control penetration into the wood—only enough goes in to bond the paint and keep it "live". SUN-PROOF is made with special fume-resistant pigments to protect against discoloration from industrial gases in the air.

For white exterior surfaces it pays to spend top money for the *best* white house paint—new SUN-PROOF ONE-COAT White House Paint 1-45. This great formulation covers better than any other paint on the market, brushes on like a breeze, and, because of controlled chalking, stays white and bright for years to come.

What kind of paint is best for stucco, brick, concrete or stone? CEMENTHIDE® Rubberized Masonry Paint is specially made to go on easy, to give you a flat finish that looks beautiful and acts as a durable shield against weather.

1. Do remove loose paint with a putty knife and wire brush. Then sandpaper to feather down edges. Spot prime all bare wood with SUN-PROOF® Primer.

2. Don't paint damaged or loose boards. Replace old siding and nail down loose boards. Use SUN-PROOF® Primer on new wood.

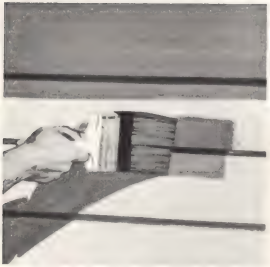


3. Do wire brush and dust thoroughly. A good outside job requires a clean, dry surface that is tight and free of unsightly cracks.

4. Don't forget to recaulk joints around chimneys, doors and window frames if needed. Be sure you get caulking compound into cracks.

5. Do reputty window frames. Scrape away all old cracked putty and clean window sash surface before applying new putty.

6. Do start at the top. Paint above ladder, so you can reach both ways freely, and thus avoid moving your ladder frequently.



7. Do spot and paint edges first. Use the brush flat, not edgewise. Keep brush liberally loaded with SUN-PROOF Latex and apply evenly.

8. Don't flow paint on, but brush it out well after laying brushfuls in spots. When painting flat areas, begin at a corner board.

9. Do coat crossbars of window sash first, then start at highest point of frame and work downward. Keep brush well loaded as you paint.

10. Don't forget to wire-brush gutters, downspouts and metal porch rails removing all dirt and rust. Spot prime all bare metal, then refinish.

11. Do be sure to hose down cement block, concrete, stucco or brick surfaces thoroughly before applying CEMENTHIDE Rubberized Masonry Paint.

12. Do clean porch and steps and let dry before repainting with FLORHIDE. For best results, roughen surfaces with sandpaper or steel wool.

Helpful tips on interior painting

DON'T start any interior painting until you've worked out a *color plan* that includes your draperies, furniture, accessories and floor covering, as well as your wall color.

To help you with this color-planning, Pittsburgh Paints has developed a clever new *Decorating Guide* (see offer on back cover) that takes the guesswork out of color-planning. You'll find that this ingenious tool lets you choose harmonizing colors like an expert interior decorator.

DO use the right paint. You, as a do-it-yourself painter, need a paint that goes on easily, covers well, doesn't show lap-marks, and comes in the shade you want. WALLHIDE® Latex fits these specifications to a "T". It's a snap to put on with a brush or roller; it covers better in one coat because it has G.H.P.® (Greater Hiding Power). WALLHIDE levels beautifully so that lap-marks disappear and it comes in over 1,000 colors to duplicate any color you've got in mind. And, of course, after painting, clean-up is easy, too. Swish the brush or roller in soapy water; that's all there is to it.

You can keep your WALLHIDE-painted rooms looking fresh and clean by simply washing them with detergent and water. Apply solution to small areas with large sponge, allow to penetrate, wipe with another sponge soaked in clear water. Change rinse water often.

Kitchens and bathrooms should be resistant to water vapor, grease and frequent scrubbing. Your best choice for these rooms is Pittsburgh SATINHIDE® LO-LUSTRE Enamel. It goes on smoothly with brush or roller, has no objectionable odor, and its gelled consistency prevents sagging as it dries quickly to a smooth satin finish. Because SATINHIDE matches the colors of WALLHIDE Latex, it is the perfect "trim-mate" for other rooms painted with WALLHIDE.

Recreation rooms, basement floors, stairs. In the average home, these areas have to stand up to punishing wear, especially when there are children in the family. The best paint for these surfaces is Pittsburgh FLORHIDE® Enamel. This paint is tough as nails, resists buffeting, scuffing and welcomes frequent scrubbing with soap or detergents.

1. Don't paint over unsightly cracks in plaster. Patch them, using quality spackling compound or patching plaster. Sand smooth when dry.

2. Do remove switch plates, wall brackets and lighting fixtures before painting. This will permit faster, easier painting.

3. Do start with the ceiling, if you plan to paint both the walls and ceiling of a room. Paint across the narrow dimension.

4. Don't try rolling paint into corners or around door and window frames. First "cut in" a three-inch strip around these areas with a brush.

5. Do start with several criss-cross strokes when painting walls with a roller. This will help you to get a much smoother job.

6. Do use a two-inch brush and paint shield when painting window sash, baseboards, trim, or bottom edges of doors. It will reduce clean-up time later.

7. Do panels of doors first. Then do outer surfaces. Smooth enamel surface with light upward strokes with nearly dry brush.

8. Don't paint outer surfaces of cabinets first. Start with difficult-to-reach interior areas, then do surfaces close to opening.

For more Do's and Don'ts see your Pittsburgh Paints Retailer...

You're talking to an expert on painting problems when you talk to the man who sells Pittsburgh Paints. He can tell you the right paint for any surface and answer questions on everything from equipment to costs to painting techniques. You'd *never* be able to get this kind of help in a store that doesn't have experienced sales people to advise you.

Ask your Pittsburgh Paints Retailer to show you his Maestro® Color Center with up-to-date selections of newest decorator colors.

He can help you color-match anything from swatches of fabric to vases to you-name-it. He can supply brushes, rollers, ladders, drop cloths and any other kind of painting equipment. Many Pittsburgh Paints Retailers also carry rental tools at nominal cost, such as floor sanders, wallpaper steamers and blowtorches.

These and other conveniences add up to the kind of *personalized* service you really *need* when you're painting.

Remember: you get the MOST SERVICE and the BEST PAINT from your Pittsburgh Paints Retailer!

New Pittsburgh Paints
Decorating Guide

makes you or your wife an expert at planning color-perfect rooms!

- Easy to use . . . just 4 steps to follow.
- Contains 14 unique color-planning cards.
- 200 actual decorator sample colors.
- 56 carpet colors.
- Complete with permanent purse-size vinyl carrying case.
- Also helpful in choosing colors for women's clothing, accessories, cosmetics.

Get your Decorating Guide now!

$1.00 FOR COMPLETE KIT, CONTAINING FREE COUPON WORTH $1.00 ON PURCHASE OF ONE GALLON OR MORE OF:

WALLHIDE® Wall Paints
SATINHIDE® Enamel
SUN-PROOF® House Paints
FLORHIDE® Enamel
WATERSPAR® Enamels and Varnishes
CEMENTHIDE® Masonry Paint

Visit your Pittsburgh Paints Retailer

or clip coupon and mail with your dollar today!

Pittsburgh Paints DECORATING GUIDE
Department PM
P.O. Box 1248, Fort Wayne, Ind. 46801

I enclose one dollar ($1.00) in cash, check or money order (no stamps or coins). Please send me a new Pittsburgh Paints DECORATING GUIDE.

NAME_____

ADDRESS_____

CITY_____ **STATE**_____ **ZIP CODE**_____

Tear out and keep for guidance when painting

Who's got everything for your Ford

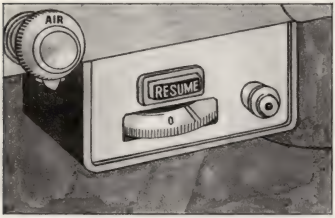
from Oil Conditioners...

Put Rotunda Oil Conditioner in your crankcase during oil changes. It reduces harmful sludge and varnish deposits in your engine, helps prevent valve and ring-sticking, improves oil flow. 16-ounce can $1.25*

to Air Conditioners

For the most in summertime comfort, have a Ford air conditioner installed in your car. This attractive, easy-to-operate unit offers exceptionally high performance — fast cool-down — cools, cleans and dehumidifies the air. $240.00*

Speed Controls...



Enjoy the convenience of driving at a constant speed with your foot off the accelerator. All you have to do is just set the dial. The automatic speed control keeps you traveling at a constant speed, will automatically cut off when brakes are applied. $71.40*

to Seat Belts

These strong, nylon belts come in seven interior-harmonized colors. They can be released instantly with one hand, yet are capable of withstanding 5000 lbs. of pull. From $5.30* each.

PRODUCTS OF Ford MOTOR COMPANY

*Manufacturer's suggested retail prices. Installation charges, state or local taxes, are extra.

Your local Ford Dealer of course!

You'll get the most for your driving pleasure from your Ford Dealer.

RIDE WALT DISNEY'S MAGIC SKYWAY AT THE FORD MOTOR COMPANY PAVILION, NEW YORK WORLD'S FAIR

NEW!

Life-saving SHOCK-PROOF® design is only one reason for buying a Millers Falls Hedge and Shrub Trimmer

LOOK FOR THIS SIGN OF YEARS-AHEAD DESIGN

MILLERS FALLS SHOCK-PROOF

Read all 8 before you invest in second best

1. **NEW DOUBLE INSULATION**

   A complete extra layer of insulation surrounds the motor, isolates the drive shaft from the armature, protects you from electric shock even if normal insulation should fail. Millers Falls Hedge Trimmers need no grounding . . . no clumsy, costly 3-wire extension cord.

2. **FAMOUS LIFETIME GUARANTEE**

   Millers Falls knows what they put into these tools . . . what you can expect of them. And Millers Falls offers a Lifetime Guarantee against any failure not caused by abuse or normal wear (see tag for details). You can't find better proof of quality!

3. **NEW CLEANER, FASTER CUT**

   New Double Action. Two precision-ground moving blades work like scissors. Cuts faster, with less browning, than the "chopping" action you get from one moving and one fixed blade.

4. **NEW VIBRATION-FREE DESIGN**

   Double Action blades moving in opposite directions cancel out vibration . . . eliminate fatigue and aching muscles.

5. **NEW CORD SAVER**

   Professional model has a coiled, stretch-type cord and a non-separating extension cord connector that hooks to your belt — making it almost impossible to cut cords.

6. **NEW DOUBLE-LIFE BRUSHES**

   "Piggy-Back" design. Reverse when worn.

7. **NEW HANDLE DESIGNS**

   Five positions for every job, every user.

8. **NEW FEATHER-LIGHT WEIGHT**

   You get big, fast-cutting 16" length at same weight as most leading 12" to 13" trimmers.

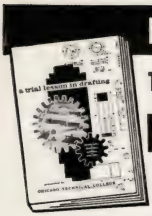
No. SP2010 Single-Edge Shock-Proof 16" Hedge and Shrub Trimmer

MF MILLERS FALLS TOOLS

Part of world-wide **Ingersoll-Rand**

MILLERS FALLS COMPANY

Dept. PM-41 • Greenfield, Massachusetts 01301



FREE!

Trial lesson in

DRAFTING & DESIGN

LEARN AT HOME IN SPARE TIME

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed! Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs. Act now!

FREE INFORMATION—MAIL COUPON TODAY!

Get FREE TRIAL LESSON plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

Est. 1904 Accredited National Home Study Council

CHICAGO TECHNICAL COLLEGE

E-203 Tech Bldg., 2000 So. Michigan Ave. Chicago 16, Illinois

Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name..... Age.....

Address .....

City..... Zone..... State.....

Repair any watch

. . . SWISS OR AMERICAN

Unique, modern Swazey System starts you making repairs right away. Develops skill step by step at home in spare time. Tuition $5 monthly. Diploma awarded. Free sample lesson. No obligation.

CHICAGO SCHOOL OF WATCHMAKING
Dept. 155, Fox River Grove, Ill. 60021

SECRETS OF . . .

Are you worth $18,000.00 a year and do you want to be your own boss?

Warner's newest shop is a breathtaker in the cosmetics industry. It is *not—and we repeat NOT*—direct selling . . . one company did it a few years ago using these exact same principles—and they now gross $100 million a year. Now, for the first time, Warner reveals the secrets that have guarded the fantastic profits possible in this 8-billion-dollar-a-year industry. This is a Ground Floor Opportunity!

LET YOUR MAILMAN BE YOUR BANKER!
Write to: The WARNER COMPANY, Dept. C-2-EW 1512 Jarvis Ave., Chicago, Ill. 60626

Sidelights from the SERVICES

By William R. Kreh

Flip-top beer cans are helping Navy scientists date undersea deposits off Baja California. It works this way: People in Baja California get all their beer in cans because of the rugged roads over which it has to be transported. The scientists know that the flip-top can first appeared in the Cape San Lucas area a year ago. In recent dives in the Cousteau diving saucer, the scientists found flip-top cans buried under two inches of sediment.

This means, they say, that sediment is building up in the area at the rate of two inches a year and they claim the cans give them a better dating method than fossils or carbon 14 tests have in the past.

They can thank the Mexican fishermen who threw their beer cans overboard for the new science which has now been tagged "beerography."

An "impossible" job has been accomplished by the Army. It has developed a computer which generates Chinese characters from a keyboard and puts them on film for photo-offset printing. Until this, all Chinese printing had to be set by hand.

Pressed for time in a section of Vietnam about to be attacked by enemy guerrillas, an Air Force sergeant used his flashlight to get a disabled C-123 plane back into the air. S./Sgt. George H. Kirby found the aircraft had suffered a crack in a control brush block, preventing the propeller from operating properly.

With darkness approaching and guerrillas on the prowl, Kirby came up with a quick solution. He extracted the carbon core from a flashlight battery and fashioned it into a serviceable brush. Installed quickly, the makeshift item enabled the C-123 to take off and return to its home base.

Air Force scientist Edmond Dewan, Cambridge Research Laboratories, Mass., has learned to control his brain's electrical signals and says they can be hooked to machines so persons completely paralyzed could communicate.

An air gun originally designed to pitch baseballs for practicing batters is giving the Air Force clues as to which munitions are most effective for jungle warfare. The

(Please turn to page 30)

An AC Filter cleans 600 quarts of oil every hour*

As you drive, the AC Full-Flow Filter cleans your engine's oil at the rate of 600 quarts an hour. This means the oil in a 5-quart crankcase is filtered every 30 seconds. AC filtering action helps reduce engine wear — promotes longer car life. AC's exclusive filtering material takes harmful contaminants out, leaves helpful additives in. The oil stays clean, retains full lubricating qualities throughout the recommended service period. Next time you change your oil ask for the AC Oil Filter engineered specifically for your car.

*Average recirculation time.

AC SPARK PLUG ❀ THE ELECTRONICS DIVISION OF GENERAL MOTORS

94.6% OF BAILEY GRADUATES ARE EMPLOYED AT TOP PAY IN THE FIELDS WHICH THEY WERE TRAINED!

DIESEL-AUTO MECHANICS DESPERATELY NEEDED!

We have a far greater demand for our students than we can fill!

We can show you an actual waiting list of leading companies throughout the world who have tried Bailey graduates — found them outstanding, and are coming back for more!

Bailey Graduates are Successful . . . RECEIVE BIG PAY — HAVE SECURE FUTURE!

The Famous Bailey Course prepares you for BOTH Diesel and Gasoline Mechanics.

This is a **must**-due to the advent of using Diesel principles, such as 'Fuel Injection' on passenger cars . . . use of gasoline engines for starting Diesel engines, etc. You learn all this at Bailey in the amount of time ordinarily required to learn just one of these subjects, **ALL FOR THE PRICE OF ONE.**

Don't be satisfied with a 'futureless', one-type job — learn how you can make **big money** now!

Write today for Free Booklet that takes you on a step-by-step camera tour through our spacious, modern shops — See Bailey students in action as they Learn-by-doing with the Famous Bailey Method of training!

We provide you with housing and part time jobs while in school, plus nation-wide placement service for graduates.

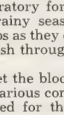
BAILEY Technical SCHOOLS

1634 S. GRAND ST. LOUIS 4, MO.

MAIL TODAY!

Please mail immediately this free booklet without obligation.

FREE BOOKLET



Name.....

Address.....

City.....State.....

Telephone.....Age.....

Sidelights from the Services

(Continued from page 28)

Air Proving Center at Eglin AFB, Fla., has set up a jungle test range. It is testing air-delivered munitions against targets ranging from dense growth to simulated lakes, desert areas and hard-surface runways. The idea is to see which weapons are most effective against an enemy hidden in the jungle or set up in small clearings.

Instead of actually delivering the munitions by plane, the Center puts them on target from a 150-foot tower, using the pneumatic "pitching machine." The gun, which has also been used by forest rangers to break up potential avalanches in mountain regions, works with compressed air and lobs in the munitions at the same speed and angle that aircraft would deliver them.

The Sprint, Army's new anti-missile missile leaves its underground cell the same way Polaris missiles are forced to the sea's surface—by a "hot gas generator" which creates pressure to pop the missile out like a dart from a blowgun. The missile's own propulsion system takes over once it's airborne.

Remote steering is possible on the Coast Guard's newest ship, the cutter *Reliance.* A little portable wheel that looks like a clock with a knob on its face is what does the trick. It's on an electrical cord that permits the skipper to handle his ship by hand from any point in the navigation area. This is especially valuable when navigating through tight places where vision may be blocked from the center of the ship's bridge.

The leech battle in Vietnam and other jungle areas may have been won by the Army. Twenty volunteer GIs recently took part in a bloodletting which the Army says may lead to an effective repellent against leeches. The proposed repellent is brownish yellow, almost odorless and has a lanolin base. It was developed by the Army's Limited War Laboratory for use in Vietnam. During the rainy season, the giant leeches attack troops as they crawl through the jungles and mush through the swamps and rice paddies.

The volunteers let the blood suckers attack their skin as various compounds were tested. One captured for the testing was about 14 inches long. More testing is needed, but Army officials feel victory is in sight. The next rainy season in the delta region of Vietnam begins in May and the leeches may be in for a surprise they weren't expecting.

HOW TO GET GOOD WATER!
you can give your family all the pure, sparkling clean, good-tasting water they can ever use!
It can cost less than $30
. . . and installation is simple!

CHLORINE — very necessary to kill bacteria. Awful to drink. Ruins coffee, mixed drinks and makes ice cubes cloudy and mushy. Easy to remove with an Aqua-Pure Taste and Odor filter.

SULPHUR — caused by hydrogen sulphide gas dissolved in water. "Rotten egg" taste and odor. Harmless—but distasteful in the extreme. Also easy to remove with the Aqua-Pure activated carbon Taste and Odor filter.

TANNIC ACID—water is brownish, has acidic taste. Caused by leaves, tree roots in contact with water. In excessive amounts, can be used to tan leather. In your drinking water amounts are usually harmless — but distasteful. Easily removed.

RUST — caused by old pipes — or — iron in solution that has been oxidized by chlorine. Ruins laundry, unpleasant to drink, clogs hot water heaters. Easily removed with an Aqua-Pure sediment filter.

DIRT — The list is endless! Sand, decayed vegetable matter, algae or "green slime" or other solids abound in ordinary drinking water. An Aqua-Pure sediment filter will often remove a pound or more of this dirt from the average home every month or so.

WORMS — Sounds like "scare" stuff, but small, thread-like nematodes live in the soil almost everywhere. These "worms" get into water, and you drink them. Easily removed with an Aqua-Pure sediment filter.

BACTERIA—If you have your own well, you have to worry about actual contamination of water, too. A low cost Aqua-Pure chlorine feeder is the simplest, most effective solution.

What's wrong with your water?

Is it safe? Is it clean? Is it good?

If you answer "yes" to these three questions . . . you are either very lucky . . . or . . . you haven't checked into your water supply lately.

City dwellers can be fairly certain about "safe" water. Municipal treatment plants use chlorine to kill bacteria.

But really *good-tasting* water, and really *clean* water . . . are rare. And, if you have your own well (pond or cistern), you'd better check safety, too. Wells can become contaminated overnight.

Over 18,000 different combinations of water problems have been identified in this country. About the only thing researchers haven't found is a plentiful supply of naturally *good* water.

This color panel at left shows a few of the more common problems. The chances are about 7 in 10 that you have at least one of these conditions right now, and in a degree severe enough to require action.

Is this "scare" talk? Not at all. Unless you are now drinking contaminated water, none of these common problems puts your family in actual danger. They just cause irritating inconveniences . . . and prevent you from enjoying some of life's basic pleasures.

Take bad-tasting, bad-smelling water, for example. You can get used to it. You might even forget what good water tastes like. Most people do, unless the taste is awful. But it'll ruin your coffee and food and wreck a mixed drink. And it's a poor excuse for satisfaction when you're thirsty.

Or take rusty, dirty water. You can learn to live with dingy laundry, rust-stained toilet bowl and sinks, sediment filled hot water tanks, and flat, lifeless drinking water. But . . . why should you?

You can even get used to contaminated water. Your body will sometimes adapt, and you might not even get sick. But . . . don't invite a guest to spend a weekend!

On the national scale, water problems are not getting better, but worse. Fortunately, the individual home owner *can* do something about them, and the answers are simple and inexpensive.

What can you do about it?

Fix it! A home water system is a lot easier to understand than an automobile or a vacuum cleaner. You can solve most water problems with just three simple low cost products.

Taste and Odor

Your problems may be excess chlorine, hydrogen sulphide, flatness, tannic acid — or what have you.

Your one best answer is a special Aqua-Pure filter that fits neatly under your kitchen sink to remove bad tastes or odors from the thousands of gallons of cooking or drinking water your family uses yearly.

It has thousands of tiny activated carbon crystals encased in a cartridge of unique design. These carbon particles have millions of active surfaces that reach out and grab taste-spoiling gases.

Once installed, you'll change cartridges once or twice a year—when water starts tasting bad again. That's all there is to it.

Dirt

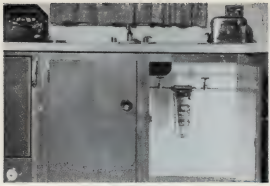
Another Aqua-Pure filter, installed in any convenient location on your main water line, filters out rust particles, algae, worms, sand, bits of organic matter, and all other solid contaminants down to 5-microns in size.

When you change cartridges — three or four times a year, usually—you'll hold your nose. "How", you'll wonder, "did I ever drink water containing *that!*"

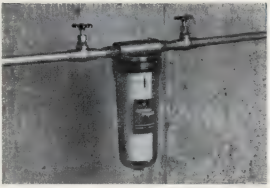
This filter will remove up to a *pound* of dirt and slime between changes.

Bacteria

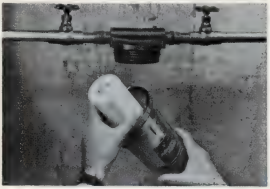
The Aqua-Pure chlorine feeder is a *must*, for well owners. It takes the place of the city dweller's municipal water plant . . . gives you a low-cost insurance policy against bacteria. See the following page for details.



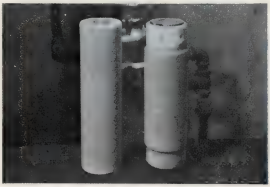
Taste and Odor filter fits on cold water line under your kitchen sink. Activated carbon particles remove excess chlorine, sulphur, and other bad tastes or odors.



Sediment filter goes on your main cold water line. The filter has a ¾" pipe thread. A stop valve on each side allows pressure to be cut off during cartridge changes.



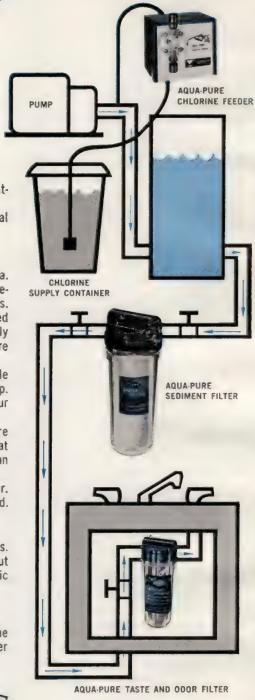
Cartridge replacement is a two-minute job. You close both stop valves, drain pressure by pressing red button on filter, unscrew sump, and insert new cartridge.



Replacement cartridges. The white cartridge, left, traps solid particles. The activated carbon cartridge, right, gives good-tasting water. Carbon particles are encased in a unique polyethylene shell.

USE WELL WATER? POND OR CISTERN WATER?

Then you've got to be your own water engineer ...here's how



You can duplicate the work done by a million dollar municipal water treatment plant — for a cost ranging from $59.95 to a top of $119.85.

The $59.95 price tag gives your family basic protection from bacterial contamination — a "must" for any private well. Here's how it works:

The Aqua-Pure Chlorine Feeder

Municipal water plants use chlorine to kill bacteria. Your well needs chlorine too — unless you're prepared to make a bacterial analysis every few days.

Aqua-Pure chlorine treatment isn't a complicated process. Your chlorine source is low cost, readily available laundry bleach — greatly diluted before being metered into your water.

The Aqua-Pure chlorine feeder is a small, simple metering device which connects to your water line just behind the pump. It is factory-set to inject just the right amount of dilute bleach into your entire water supply.

You wire the Aqua-Pure chlorine feeder directly to your pump's pressure switch — so it'll operate only when the pump operates. This means that every drop of water gets an equal amount of chlorine — with never an overdose.

The Aqua-Pure Chlorine Feeder puts you on a par with the city dweller. You've got water that's "safe" to use — but not necessarily clean or good.

The Aqua-Pure Sediment Filter

For $29.95 you can get cleaner water than any city water plant delivers. You connect this filter just after your pressure tank, where it'll filter out the precipitated iron — as well as sand, algae, worms, bits of organic matter, and rust. Water from this filter really sparkles!

The Aqua-Pure Taste and Odor Filter

Your water may be pure and sparkling clean — but still bad-tasting. The Aqua-Pure Taste and Odor filter will put the finishing touch on your water system.

This is the Aqua-Pure unit you'll really enjoy! Cost? Only $29.95.

SEND FOR FREE WATER FACTS

Aqua-Pure Division
CUNO ENGINEERING CORPORATION
Subsidiary of American Machine & Foundry Co.
80-1 South Vine Street, Meriden, Connecticut

Your name.....

Address.....

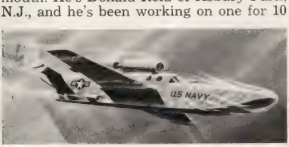
City..... *State*.....

16 PAGES OF FACTS EVERY HOME-OWNER NEEDS.

CUNO®
AQUA-PURE®

Sidelights on AVIATION

Flying submarines, now seriously under study by the U.S. Navy, may raise a few eyebrows around the country, but the news is turning down the corners of one man's mouth. He's Donald Reid of Asbury Park, N.J., and he's been working on one for 10



ARTIST'S SKETCH of flying sub proposed by Convair

years without getting any official attention.

Convair Division of General Dynamics Corp., which got the $36,000 government study contract, has designed a three-engine model.

Reid, who has gone through 20 models

ACTUAL MODEL of flying sub built by Donald Reid

using his own money, is working toward a "flub" that would use one jet engine for both flying and underwater propulsion.

The last five models have been man-size, and his son, Bruce, has been his chief test pilot. Bruce has had the flub in the air on short, straight-ahead flights, and underwater for short periods. This summer they hope to put the two together and take off from water, land and submerge.

The current model is a mongrel scrounged mostly from parts of crashed airplanes. It has a 65-hp Lycoming engine with propeller mounted above the fuselage/hull for flying and an electric-powered screw for underwater propulsion.

Reid says he was laughed out of Washington when he proposed such a vehicle to the Navy 10 years ago. "Now," he says, "I'll just finish it and give it to the Air Force."

Kevin V. Brown
Aviation Editor

. . . and years of future security in the multi-billion dollar construction industry, in this country and *overseas!* Learn how at National, the original school of heavy equipment operation. For men ages 17 to 56. Amount of previous *education no barrier.* National is NOT a correspondence school. You train on school-owned diesel-engined machines at National's huge proving ground in North Carolina. Full 220 and 440 hour courses. Full-time Job Advisory and Counselling Director for the exclusive benefit of graduates. VA approved. Payment plans available. Write TODAY for FREE catalog.

Since National School was founded ten years ago, students from all 50 states and 28 foreign countries have been enrolled. Hundreds of graduates are now working in construction for higher wages than they ever made before.

NATIONAL SCHOOL OF HEAVY EQUIPMENT OPERATION Dept. D-63
P. O. Drawer 1686, Charlotte, N. C.

Please send me FREE illustrated school catalog and complete information. I understand there's no obligation.

Name..... Age.....
Address .....
City..... Zone..... State.....

Earn Extra $ $ $ RIGHT AWAY
You Can Be a SKILLED LOCKSMITH

LEARN AT HOME

Here is one field where mature men can earn better pay—have unlimited job opportunities. No need to wonder how you'll make ends meet if laid off, replaced by a machine, disabled, forced to retire! Locksmithing skill lets you say goodbye to such worries—CASH IN FAST in a big opportunity job or your own high-profit business spare-time, or full-time.

All Locks, Keys, Tools, Materials, & Equipment Supplied.

Age, education, minor physical handicaps don't matter in this booming profession. As little as one hour a week doing real jobs on all kinds of locks and keys under expert guidance brings quick mastery—and ends job and income worries forever.

FREE Book, Sample Lesson Pages. Send for FREE illustrated book and sample lesson pages today. No salesman will call. Only school of its kind. Licensed by N.J. State Board of Education. Accredited Member Nat'l. Home Study Council; VA Approved.

LOCKSMITHING INSTITUTE
Division of Technical Home Study Schools
Dept. 110-055, Little Falls, New Jersey

FINDS 3-WAY INCOME INSURANCE

"I earned $2,901.72 while learning locksmithing and now make $5000 a year—doubling my income. Worries about layoffs, retirement, more money are over for me—thanks to the Locksmithing Institute Course!" — Stanley Nowak, Saginaw, Mich.

306 Pieces of equipment LOCKS, PICKS and TOOLS supplied for use with course.

SEND FOR FREE BOOK

LOCKSMITHING INSTITUTE, Dept. 110-055, Little Falls, New Jersey

Est. 1948

Please send FREE Illustrated Book—"Your Big Opportunities in Locksmithing." complete Equipment folder and sample lesson pages—FREE of all obligation —(no salesman will call).

Name.....
(Please Print)
Address .....
City. State.....ZIP.....

Take Charge of Your CAREER

By Richard Dunlop

TRAINED AUTO MECHANICS may not be quite as scarce as hen's teeth, but any motorist knows they are in short supply. This spring Chrysler Corp. dealers, acting with Federal Government support, are recruiting apprentices for a new program of mechanic training. Both young men and older men displaced by automation are being accepted.

"With the number of cars in use now approaching 72 million, the need for trained mechanics is growing every day," explains Chrysler president, Lynn Townsend.

The trainees will work in Chrysler garages for up to three years as apprentice mechanics at apprentice wages. Two nights a week for one year they will receive formal instruction in auto maintenance and repair at approved training centers in high schools or junior colleges near their place of work. Their on-the-job training will continue until they pass all requirements for skilled automotive technicians. Chrysler intends to offer the program first in the Detroit, Cleveland, Pittsburgh and Cincinnati regions. If you're interested, ask your local Chrysler dealer to let you know when things are ready to roll in your area.

Avoiding "Silent Firing" Industries

"Silent firings" are spreading among clerical jobs. The very expression has an ominous ring to it, for it refers not to people who are being discharged, but to people who would have been hired except for automation. Companies affected simply wait until an employee retires, is promoted or goes elsewhere, and then do not replace him. According to a Labor Department Bulletin, office workers doing sorting, routing, classifying, filing, posting, checking and maintaining records are the most likely ghosts-to-be.

The electronic data processing which displaces them is currently concentrated in firms manufacturing transportation and electrical equipment, in insurance and finance companies, and in government agencies, chiefly Federal.

As more computers are programmed electronically, even keypunch operators are no longer needed. Despite this, operators who have lost their jobs usually find no difficulty in getting keypunch jobs elsewhere, and the demand for keypunch operators is still growing and will continue to grow. The reason? Many businesses, particularly smaller ones, find that they do not need electronic programming and actually prefer card programming.

Automation Loses a Round

In some industries there is a swing back from automation. Phelps-Terkel operates six clothing stores in the Los Angeles area. Some time back it introduced a punch-card accounting system to speed up the sending of bills to its customers. Then, with their recent statements, customers received a machine card with this note:

"You are holding the last punched card you'll ever receive from Phelps-Terkel. We've tried to make our peace with automation. But it hasn't worked. Ours is just not a machine business. Consequently, we are reverting to our slightly archaic yet highly personalized accounting methods. We think you'll like our new/old billing method better. We know we will."

On the back of the card was the wry note. "Please fold, bend, mutilate and staple."

President Dave Phelps reported that he received an eloquent reply from one customer. "Thank God for people," he wrote. Amen, we say.

Opportunities This Summer

Summer jobs at the New York World's Fair are open to young adults 18 years old or older. Exhibitors are hiring stock handlers, guides, waiters and all-around helpers. For information write to World's Fair Placement Center, New York State Employment Service, 48-09 108th St., Corona, L.I., N.Y. 11368.

Students at least 17 years old may also apply for summer jobs in Washington working for the government. It is hot along the Potomac in the summer, but summer "apprentices" who replace vacationing government employees have the chance to see their government from the inside out and obtain experience which can help them land a permanent job later on. Jobs require clerk-typist examinations and include general office work, mail clerks, messengers, typists and secretaries.

After you have gained your civil-service rating through your local Federal office, write directly to the personnel manager of the department or agency of your choice in Washington.

Father and Son Compete for Success

Grant Lawson at 52 years of age was the father of 18 children. He had been a wire-puller at Reynolds Metal Company's Dix-

(Please turn to page 38)

U.S. GOV'T SURPLUS

DIRECT FROM GOV'T. FOR ONLY A FRACTION OF ORIGINAL COST. BUY FOR AS LITTLE AS 2¢ AND 3¢ ON THE DOLLAR!!

Examples:

JEEPS $63.00
BOATS $178.00
BICYCLES $5.50
TELESCOPES $4.00
LEATHER BOOTS 65¢
TYPEWRITERS $8.79
AIRPLANES $159.00
REFRIGERATORS $5.00
PASS. BUSSES $208.00

COMPLETE SOURCES AND INFORMATION ON HOW YOU CAN BUY THOUSANDS OF ITEMS FROM GOV'T—ONLY $1.00

FREE!! FREE!! EXTRA 48 PAGE SECTION WITH PICTURES AND PRICES OF MORE THAN 500 ITEMS. YOU CAN ORDER DIRECT BY MAIL AT RIDICULOUSLY LOW SURPLUS PRICES. YOURS FREE WHEN YOU SEND $1.00 FOR THE DIRECTORY. *THIS IS THE WORLD'S LARGEST STOCK!!*

RIFLES 10.95
PARACHUTES 21.95
BOATS 16.45
SHOES 1.65
JACKETS 3.25
TENTS 6.55
BAYONETS 2.15
HAND GRENADES 1.65
COMMANDO KNIVES 1.38
COMPASSES 1.05
HOLSTERS 2.15
MACHETTES 2.15
GOGGLES 61c

PISTOL BELTS 1.05
STEEL HELMETS 2.15
GIANT BALLOONS 1.38
MODEL CANNONS 1.38
BAYONETS 1.65
CARTRIDGE BELTS 1.05
STEEL AXES 2.70
CANTEENS 67c
FOLDING STOVE 1.38
FIELD PACK 1.05
MIRRORS 61c
FIELD JACKETS 3.25
AND Bunk Beds,

Life Rafts, Walkie Talkies, Swords, Parat'roopr Boots, Flags, Sleeping Bags, Cots, Phones, Mine Detectors, Bugles, Hand & Leg Irons, Blankets, Bullet Proof Vests, Flares, Cartridge Belts, Ammo, Rifle Scopes, Maps, Shovels, Canteens, Saddles, First Aid Supplies, Sunglasses, Mess Kits, Haversacks, AND HUNDREDS MORE!

BUY ONE, TWO OR A DOZEN OF ANY ITEM YOU WANT.
MINIMUM ORDERS AS LOW AS $3.00 ACCEPTABLE

FREE HOME TRIAL COUPON

SURPLUS BARGAINS, DEPT. 134-5
605 THIRD AVENUE
NEW YORK 16, N. Y.

I enclose $1.00. Send the combined catalog and directory immediately. I understand that my money will be refunded if I am not completely satisfied. Also I will receive a full refund with my first order of $10.00 or more.

Name _____ (Please Print)
Address _____
City _____ State _____

FULL PURCHASE PRICE OF $1.00 REFUNDED WITH FIRST ORDER OF $10.00 OR MORE

--Earn To $15 An Hour, Full or Spare Time--

INVESTIGATE ACCIDENTS

CAR FURNISHED **EXPENSES PAID**

NO prior experience needed. Only average education required.

YOU PERFORM A REAL SERVICE

WHILE ENJOYING A BIG-PAY CAREER

As an Accident Investigation specialist you will (1) INVESTIGATE FACTS and (2) DISTRIBUTE MONEY as the representative of wealthy organizations.

No other business offers you greater opportunities. Here's why: The huge, rapidly expanding Accident Investigation field right now distributes more money than any other service industry. And it's growing *fast*. Over 200 MILLION ACCIDENTS must be investigated this year for Insurance Companies, Airlines, Steamship Lines, and Government Offices.

KEEP PRESENT JOB UNTIL READY TO SWITCH

Already hundreds of men we have trained are earning thousands of dollars extra each month. Joe Miller earned $14,768 his first year. A. J. Allen earned over $2,000 in ten weeks. Robert Meier says "I'm now earning $7.50 to $15.00 an hour in my own business . . . Universal's course is wonderful."

FREE EMPLOYMENT HELP GIVEN

Firms needing men from coast-to-coast, in Canada and overseas, call upon Universal. *We place far more men in this booming field than any other individual, company or school.* Write today. Let me show you how easy it is for you to get into this exciting new career in just a matter of weeks. No obligation. No salesman will call.

Mail Now for FREE BOOK

M. O. Wilson, Dept. PM-5
Universal Schools,
6801 Hillcrest, Dallas 5, Texas
Please rush me your FREE BOOK on Big Money In The Booming Accident Investigation Field. I will not be under the slightest obligation — and no salesman will call upon me.

Name _____
Address _____
City _____ Zone _____ State _____

AUTOMATIC RESPONSE
FORWARD OR REVERSE!

UNIQUE
REO-MATIC DRIVE
on new
REO Lawn Skiff

One test-ride will convince you. There's absolutely no riding mower like the Reo Lawn Skiff . . . easiest way to mow a sea of grass. Revolutionary new automatic drive! Choose from two speed ranges, then step down on the Reo-Matic Drive pedal for instant response, either forward or reverse. Full 32" mower floats over rough terrain without scalping. Automotive-type steering! Big, smooth-muscled 6-H.P. engine starts electrically at the turn of a key. See Reo riding mowers, as well as rotaries and reels, now on display. Write for name of your nearby Reo dealer and for free, full-color brochure. Wheel Horse Products, Inc., 425 West Ireland Road, South Bend, Indiana.

REO by Wheel Horse

REO RELIABLES
—the powerful performers

Take Charge of Your Career

(Continued from page 36)

on, Ill., plant for 17 years. Then Reynolds pulled the plant out of Dixon. Lawson had 20 mouths to feed and no job in a town where 1,125 other people were also out of work. Lawson and his 18-year-old son, Dale, both went to the State of Illinois Employment Office at nearby Rock Falls looking for work, but there was no work to be had without retraining.

Both Lawsons enrolled in their state's Dixon retraining program, which taught them maintenance skills and the psychology of mentally retarded patients. Father and son competed with one another throughout the 12-week course to see which one could get the best grades. Then they took the civil service exam required for jobs at Dixon State School. Both passed, but Grant scored three points higher than did his son Dale, an achievement for which he is most grateful. Today father and son maintain the equipment in the school and help retarded children take their first steps along the road which may some day bring them independence.

In Illinois towns which have been hit by plant relocations, the State is also retraining out-of-work men as auto body repairmen, service station attendants, auto mechanics, bookkeepers, farm mechanics, building maintenance men, television and washing machine servicemen, welders and nurserymen. If you would like a free list of schools offering courses in these technical specialties, drop a postcard to the Careers Editor, *Popular Mechanics*, 575 Lexington Ave., New York 10022.

Artistic Crime Buster

Richard Bingham, a 27-year-old regional planner for the St. Clair County Regional Planning Commission at Port Huron, Mich., has always "found himself picking up a drawing pencil." When he was a student at Port Huron Junior College, he drew "The Skipper," the cartoon symbol of the school. He took a course in architectural drawing and designing through the International Correspondence Schools, Scranton, Pa., to help advance himself on the job, and soon became a part-time member of area crime-busting teams. First the Port Huron police and then the FBI asked him to use his new skill in drawing composite portraits of wanted criminals based upon witnesses' descriptions. In his spare time, Bingham helps track down bank robbers and holdup men.

That's one way to add spice to your career. Maybe some of you have other examples *PM* readers would enjoy hearing about? If so, write us. ★★★

UTOPIA
He's *meditating* yesterdays...*speculating* tomorrows.
Immersed in his thoughts, he revels in the sounds of green-necked mallards and black-billed canvasbacks... ...high-flying pintails...low-planing widgeons.
His heart is where his dreams are.
Within these pages he finds information and products that whet his selective appetites...satisfy his unusual hungers...fulfill his natural instincts.
He combines ingenuity with imagination...
...and he reads this magazine, just as you do.
MPA
MAGAZINES/YOUR WORLD OF IDEAS AND PRODUCTS!

CLINIC FOR HOMEOWNERS

Q From time to time, we've noticed a disagreeable odor in our new bathroom. We have a septic tank. Plumbers we've called in say there is nothing wrong with the installation. But still the odor recurs intermittently. We're at a loss to account for it. Can you?—N.M., Ky.

A If your plumber says the installation has been made properly we assume the installation is properly trapped, that the septic tank and system are adequately vented, that all joints in the disposal plumbing are tight and that all traps are clear of obstruction. If so, it is difficult to even guess which of many possible defects is causing the odor. For example, a pinpoint leak, in the disposal system (soil pipe) may permit gas to escape, yet not show as a water leak. This seems unlikely, but has happened. Another possibility is a partially or wholly clogged vent due to some object having been dropped into it. This too, is more or less unlikely but has occurred. On some occasions intermittent bathroom odors have been traced to gases from the vent, which, under certain atmospheric conditions, may drift into the bathroom through an open window before dissipating. With this in mind, we suggest you have the system checked again.

Q Last summer I coated all my hand tools and several small circular saw blades with light oil, wrapped the metal parts in pieces of flannel and placed in drawers in my bench. Later, in the fall, I found rust spots on many of the metal parts, especially on chisel and saw blades. Why did the tools rust in the first place, and why only in spots?—S.L., Fla.

A Yours is a common problem, especially in a humid climate. Oil cannot protect from moisture when it rubs off the surface or is absorbed by another material. This is what happened when you coated the tools with oil and then wrapped them in flannel. Some of the oil coating was absorbed into the fabric, or rubbed off in the handling, leaving certain areas of metal unprotected. Most fabrics will also absorb and retain moisture, especially in a drawer or other enclosed area. Actually, you would have done better to coat the tools with a medium oil and leave them on top of the bench. Tools also can be protected against rust by coating with paste wax or with any of the clear spray coatings supplied in pressurized cans. But care must be taken when applying to cover all exposed metal. Tools so coated usually can be stored in drawers with little, if any, risk of damage, even during periods of high humidity. You must, of course, make sure the tools are clean and free of any oil before applying the protective coatings.

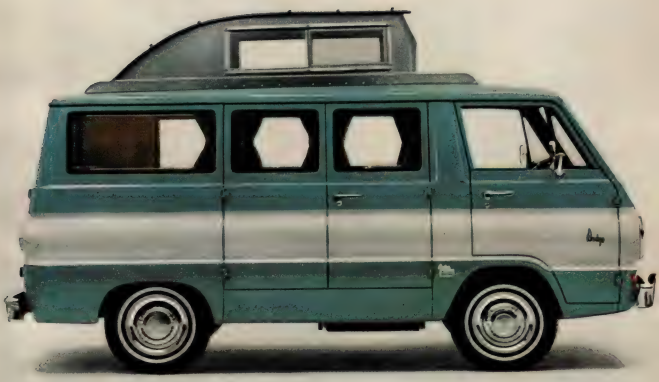
Q How does one drill small holes in plastered walls without chipping? I tried a hand drill with small twist bit but the plaster breaks away around the hole. In addition, the drill was ruined.—A.T., Md.

A The main reason the plaster chips or breaks away around the hole is that the plaster is not hard enough to prevent a slight wobbling of the drill, which enlarges the hole. The dulling of the drill is caused by the abrasive action of the plaster. Try using an ordinary nail as the drill. First, lay the point of the nail on an anvil and flatten it slightly by striking with a hammer. Then cut off the head and chuck it in your hand drill. Stick paper tape—or masking tape—to the wall over the point where the hole, or holes are to be drilled. Mark the location of the hole with pencil, then after the nail-point drill is started, use just enough pressure to keep it cutting. The "drill" will wear rapidly, but is easily restored.

Q Last summer I poured about 25 ft. of concrete walk, using a recommended mix. Now the whole surface is powdery and the entire walk seems to be disintegrating. What's wrong and how can I make repairs?—O.L., Mass.

A Judging from your description, we doubt if the walk can be repaired. We think it will be necessary to break it up and pour a new one. Probably, you failed to cure the concrete properly after pouring. After breaking up the old walk excavate for a gravel or crushed stone fill at least 4 in. deep. Then pour the concrete in a suitable form and after leveling and troweling allow it to take the initial set, then cover with layers of burlap, straw, or marsh hay and keep the covering damp by hosing for a period of several days—perhaps even a week in hot, dry weather. Do not permit the covering to dry out during the curing period.

fun
is where you find it
drive it
camp it
etc. it



Dodge Builds Tough Trucks DODGE DIVISION CHRYSLER MOTORS CORPORATION

DODGE TRUCK OPERATIONS, P. O. Box 2088, Detroit, Michigan 48231. I want to know more about the new Dodge Camp Wagon. Please send me complete information.

Name_____ (PM

Address_____

City_____ State_____ Zip Code_____

out of this world?

and how!

Want out? Hop in. The Johnson Deluxe is a 17-foot passport to happiness — with all the "extras." Removable shock-absorber lounge seats (carry ashore!) . . . storage walls that gobble everyone's gear, keeping the flat floor neat . . . quick-change convertible top. Flip-a-switch controls for everything from raising the lower unit to lifting the windshield for a breeze that beats anything out of a fan. Eager performance from any of three Johnson stern drives. ■ Safety, too. If you deliberately filled the boat with water, built-in flotation would keep five afloat, also life preservers are in each seat. ■ Whisk away in the 'Johnson glide' — that fast-stepping ride that levels with you all the way from board-on to tight turns, over washboard seas or lazy lagoons. ■ Try a new world soon. Your Johnson Boats dealer has the ticket.

Johnson Boats *First in DEPENDability*

Division of Outboard Marine Corp., Dept. PM-53 • Waukegan, Ill.

3 Models for '65 • Stern Drive Power Options: 88 hp, 120 hp, 150 hp • Plus Outboard Power! • Write for Free "Boat Ride" Brochure!

ARROW

Automatic

STAPLE GUN TACKERS

SHOOT A STAPLE

WHEREVER YOU'D DRIVE A NAIL!

HEAVY DUTY Model T-50 (illus.) $12.50
Others from $4.95

ONE SQUEEZE – AND YOU'VE NAILED IT!

HARDWARE/HOUSEWARES WEEK SPECIALS!

BUY THIS

T-50 Heavy Duty
STAPLE GUN TACKER
$12.50

Powerful, all-purpose tacker for 1001 home improvement and fix-it fastening jobs*

GET THIS!

P-66 Plier-Type
STAPLER
Plus box of 1,000 staples
only **$1.00**
Reg. $1.98 Value

Compact, portable hand stapling plier for home, school, office, travel, etc.

MAKE SPRING FIX-IT TIME A BREEZE!

FREE Wire Attachment
WITH PURCHASE OF
T-55 Intermediate Duty
STAPLE GUN TACKER
$9.95 Value – for only $8.95

FREE Wire/Screen Attachment
WITH PURCHASE OF
JT-21 Light Duty
STAPLE GUN TACKER
$5.70 Value – for only $4.95

Arrow Automatic Tackers make Spring "fix-it time" a breeze! Faster, cheaper and better for ceiling tile, insulation, screening, upholstery, weatherstripping, wiring – 1001 home and professional fastening jobs.

(Model JT-21 not suited for Ceiling Tile)

AVAILABLE AT HARDWARE • LUMBER • BUILDING MATERIAL • STATIONERY • VARIETY AND OTHER RETAIL OUTLETS
ARROW FASTENER COMPANY, Inc., One Junius Street, Brooklyn, N. Y. 10012 *"Pioneers and Pacesetters For Almost A Half Century"*

Noteworthy New INVENTIONS

By M. J. Pedersen

Freeloading automobile drivers, cruising around for a parking meter with lots of time left on it, may be in for a rude surprise one day. A newly patented meter, which sends out ultrasonic pulses every so often, "senses" whether or not a car is still beside it. If the car has pulled out, the meter will go back to zero; when a vehicle's parking time is up, the meter will signal for a policeman. This tattletale of a parking meter earned patent 3,166,732 for Nils Ljungman, Narberth, Pa., and James E. Brown, Jr., Philadelphia, Pa.

A rocking wheelchair, with a spring-centering rocking mechanism connected between the seat and the base of the chair, provides needed exercise for invalids. It won patent 3,167,350 for Mrs. Louise A. Kiel, Newton, Iowa.

Photo flashbulbs are being used by the U. S. Navy to fire rockets, with the burst of light igniting the solid propellant in a rocket motor. A secret for more than 12 years, this novel method, which is safer than explosive igniters such as black powder, was developed by Bernard Smith and Clarence E. Weinland, of Inyokern, China Lake, Calif., and was awarded patent 3,167,015.

Seven little boats, or compartments, fit together to form an ice cube tray-shaped boat that is virtually unsinkable, remaining afloat even if several compartments should be destroyed. With its telescopic compartments, which can be stored one inside another, the boat can be transported easily and assembled or disassembled quickly, and may prove useful militarily as floats or pontoons supporting floating bridges and the like. Patent 3,167,791 went to Motiejus Balciunas, Chicago, Ill.

Water control gate located in a stream or irrigation channel lifts automatically when the water level upstream gets too high and more than the prescribed pressure is put on the arc-shaped face of the gate. Allowing excess water to escape, thereby keeping the upstream water at a uniform level, the gate earned patent 3,168,814 for George R. Hurlburt, Farmington, N. M. It is currently being used by the Bureau of Reclamation of the Dept. of Interior on spillways at the Missouri River Basin Project.

A runway coating that will prevent jet planes from skidding dangerously when landing in wet weather received patent 3,168,019 for Bernard S. Lynn, Los Gatos, Calif. The anti-skid compound, a mixture of mesh plaster sand, asphalt emulsion, water, Portland cement and powdered wood rosin, can slow down a jet three times as fast as a regular runway, is also easy on giant airplane tires.

The gear control system of automatic transmissions, used for the past 15 years in millions of Ford cars, was finally granted a patent, 3,165,946. Robert W. Wayman, North Riverside, Ill., who applied for a patent in 1950, was unable to explain the delay in awarding a patent on his invention, which incorporates 106 separate ideas and is one of the largest patents ever granted in the transmission field.

Mechanized kisses will be forthcoming from a doll that won patent 3,169,343 for Sam Freimauer, Hillside, N.J., and Joseph Lieberman, Brooklyn, N. Y. A lever mechanism, acting upon a bellows attached inside the doll's head, simulates both the lip movement and sound of a kiss. Lift the doll's arm and the mouth pushes out and gives a loud smack.

Three-in-one flashlight functions as a fire alarm and pushbutton signaling device, in addition to its obvious uses. The fire alarm can be hand-set to sound an alert when the temperature in a given area gets too high, and the distress signal sounds for help with the push of a button. This multi-purpose device earned patent 3,171,109 for Andrew L. Appel of St. Louis, Mo.

Interchangeable heel for a shoe consists of a mortised, removable cap which locks onto a tenon protruding from the shoe. When heels become worn, they may be interchanged, to prevent lopsided wear. Charles Clark of Jersey City, N.J., was awarded patent 3,159,928 for his idea.

Computer guides camera on target to obtain clearer pictures taken from airplanes, satellites or missiles. Adjusting the camera or synchronizing the camera film to compensate for the movement of the plane, which is traveling at a supersonic speed and a high altitude, the computer earned patent 3,163,098 for Friend H. Kierstead Jr., Cuyahoga Falls, Ohio.

Sophisticated Selections for Shrewd Shoppers

Would you go to extremes for the especially-good? . . . the distinguished? . . . the outstanding values in health and personal care drug products? Isn't it nice to know the extreme is only as far as your nearest mailbox. Distinctive toiletries for discriminating men—the kind women appreciate most—plus personal-care products usually associated with far-greater costs. If it's the contents that count with you . . . take HUDSON'S smart-but-not-gaudy packaging and enjoy the extremes in quality and economies promptly and conveniently delivered right to your door. **Backed by a quarter-century of integrity in serving millions of families with world-famous HUDSON VITAMINS.**

FREE BONUS
Gift 50 BANTONS with purchase of 2 tubes each $1.49 SMOKURB or pur-chase of 2 pkgs. $1.00 BANTONS tablets. Relieves tiny tension for temporary relief of simple nervous tension.

TANSUM
Protective Tanning Lotion

Greaseless, stainless TANSUM promotes tanning without painful sunburn, dryness or peeling. Protects against windburn. Unbreakable bottle.

#408 8 oz. bottle **$1.65**
INCL. FED. TAX

VERDAN
Anti-Dandruff Shampoo

Here is effective control of excess oil and bacteria associated with dandruff. Dew-green VERDAN, medicated, concentrated gel.

#409 .5 oz. tube **98c**

LORD HUDSON SHAVE CREAM

Richest, densest lather yet in an aerosol can. Penetrates and wilts the heaviest beard, soothes tender skin; scented.

#415 11 oz. can **79c**

Clinically-tested SMOKURB®
Smoking Deterrent

Lobeline Sulfate and Benzocaine in a peppermint flavored candy coated chewing gum.

#302 100 tablets **$2.95**

RELY-ON
Anti-perspirant and deodorant aerosol spray.

Ideal for the entire family. No messy drip or trickle. A one-second spray protects all day.

#426 3 oz. bottle **$1.10**
INCL. FED. TAX

LORD HUDSON AFTER SHAVE

Regal new fragrance . . . distinctively masculine. Tones and conditions skin. Leaves you feeling refreshed all day long.

#400 6 oz. bottle **$1.49**
INCL. FED. TAX

PARADE
Hairdressing and conditioner.

Lanolin-rich concentrate brings life, luster and body to dull, dry hair. Makes unruly hair manageable, even after shampoo.

#410 .2 oz. tube **87c**
INCL. FED. TAX

PODIA-MIST®
Medicated Athlete's Foot Remedy

A highly effective clinically tested combination of ingredients in a pleasantly scented powder. Unbreakable bottle.

#335 1½ oz. bottle **85c**

FREE OR EXTRA COST WITH THIS AD! Limited Time Offer

Heavy-frame Modern Style **$2.98 SUN GLASSES**

Get acquainted with Hudson Toiletries & Personal Care Products now . . . with purchase amounting to only $5.00 or more of the products and prices advertised on this page you will receive **FREE OF EXTRA COST** a pair of fine **SUNGLASSES** advertised and sold at $2.98 or more in fine stores. Adjustable, tortoise-shell type frame, smoke-amber color lenses, heavy hinges, wire-core temples. **Offer expires June 15th, 1965. ORDER TODAY.**

HVP® HUDSON VITAMIN PRODUCTS Division of Hudson National, Inc.
89 Seventh Avenue, New York, N.Y. 10011

WORLD'S LEADING DIRECT-BY-MAIL DISTRIBUTOR OF VITAMINS, DRUGS AND TOILETRIES

Hudson National Inc., Dept. V-261, 89 Seventh Avenue, New York, N.Y. 10011

Gentlemen: Please send the following order postage paid*

Quan.	Item	Each	Total	Quan.	Item	Each	Total
	#408	$1.65			#426	$1.10	
	#409	.98			#400	$1.49	
	#415	.79			#410	.87	
	#302	$2.95			#335	.85	
		TOTAL*				TOTAL*	

☐ I enclose check (or money order) to cover total amount of $_____

☐ My order totals $5.00 or more. Please include FREE Sun Glasses as shown, a $2.98 value.

☐ Please just send FREE COPY of Famous Hudson Catalog.

Name_____

Address_____

City_____ State_____ Zip Code_____

*On orders under $3.00 add 25c for postage and handling.

AIMING AT HOLDING THE INSIDE shoulder as a marker, we found the Tiger (above) could do better at four mph faster than the standard Alpine (right). Tiger rack and pinion steering is slightly heavier than the Alpine recirculating ball system

Spotlight on Sunbeam's Tiger

How Much Bite Does New Ford Power Give It?

By Ed Nelson

IT HAS THE SKIN of Sunbeam's little, two-place Alpine. But under that slicked-up British hide beats a stout American heart—a 260-cubic-inch Ford V8.

You can call Sunbeam's Ford-powered eye-opener a Tiger in the clothing of a frisky kitten if you like. Or a heavily armed destroyer disguised as a yacht.

What does it mean? Among other things we'll come to, it means an extra $1100 on the price tag. While the regular Alpine's ticket was cut $200 this year to $2399, the Tiger sells for $3499. You wouldn't put out that extra cash because of a mysterious affection for Mr. Ford. What has the Rootes Group done to the old Alpine?

About the time they had trimmed down the ungainly tail fins from the Alpine to create the Series IV body, it began to get extra variety. A full synchromesh transmission was one move. And, coming as a shock to the purists, an automatic box was another, presumably for the ladies.

While the Tiger had the most interest for me, I wanted to try them all. For the ladies' version, I solicited help from "Norma." No sports car buff, she's an upstate grade school teacher. Her first reaction to the Alpine: "I like the way it goes—the way it feels under my feet."

We found, however, that the buckets, with all their advantages, were less comfortable than expected. The reclining feature is pleasant—one that should be adopted by more U.S. makers. But Norma complained of low-back strain: I found my seat somewhat too wide for Alpine's.

Even with 90 hp for 2180 pounds (a power to weight ratio of 24.2 lb./hp), the Alpine is a thoroughly spritely rabbit, partly due to the 3.89:1 rear axle. (The Tiger's, with 164 hp, is 2.88:1.)

The steering column, in every version from the Series IV automatic to the Tiger, telescopes with two and a half inches of adjustment. Most drivers will be able to stretch their arms out almost straight.

We switched to the manual transmission Alpine and found a delightfully smooth, quick-acting, exact box with ratios relatively close. All-synchro boxes are becoming less rare, happily, but Norma isn't used to the idea. "It seems almost like sacrilege" to shift into low while the car's under way, she said.

Actually, no test can tell you how the Tiger feels. While we were on the track, hopping back and forth from car to car, the idea grew stronger and stronger that the Tiger was actually bigger. Not awkward and wallowy, just bigger and stronger. We all knew better, of course—but the impression got so strong it was hard to ignore. Both suspension systems are firm, and I felt as many bumps through the Al-

(Please turn to page 46)

QUICK, PRACTICAL WAY TO HIGHER PAY WITH N.T.S. HOME TRAINING

Move up faster, make more money the "Project Method" way.

ELECTRONICS DIVISION

1. Electronics-TV-Radio Servicing and Communications
2. Master Course in Electronics-TV-Radio Advanced TV and Industrial Electronics
3. FCC License Course
4. Radio Servicing (AM-FM-Transistors)
5. Television Servicing (including Color)
6. Stereo, Hi-Fi and Sound Systems
7. Basic Electronics
8. Electronics Math

NO KIT DEPOSITS

AUTO-MECHANICS DIVISION

1. Automotive-Diesel Master Course
2. Automotive Mechanics
3. Diesel Mechanics
4. Engine Tune-Up and Electricity

Eighty million cars and trucks need maintenance. Here's real opportunity! Get and keep valuable tools. No kit deposits, no extra cost.

HOME APPLIANCE DIVISION

1. Home Appliance Technician's Course

Prepares you quickly for a business of your own or important jobs with manufacturers and distributors. Earn while you learn, using tools and tester you get with your course. No kit deposits.

AIR CONDITIONING-REFRIGERATION DIVISION

1. Air Conditioning-Refrigeration Servicing Course
2. Air Conditioning Refrigeration & Electrical Appliances Master Course

Good income in servicing and installation. Big equipment kits with both courses at no extra cost. No kit deposits.

NATIONAL TECHNICAL SCHOOLS
4000 S. Figueroa St., Los Angeles, California 90037

HIGH SCHOOL AT HOME

National offers accredited high school programs. Take only subjects you need. Study at your own pace. Everything included at one low tuition. Check special High School box in coupon for complete FREE Diploma information.

NATIONAL TECHNICAL SCHOOLS
WORLD-WIDE TRAINING SINCE 1905
4000 S. Figueroa St., Los Angeles, Calif. 90037
YOU ENROLL BY MAIL. NO SALESMAN WILL CALL.

RESIDENT TECHNICAL TRAINING AT L.A.

You can take classroom training in our famous Resident School in Los Angeles. Check Resident School box in coupon for full details.

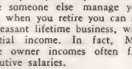
SEND FOR FREE BOOK & SAMPLE LESSON

NATIONAL TECHNICAL SCHOOLS, DEPT. 201-55
4000 S. Figueroa St., Los Angeles, Calif. 90037
Please rush FREE BOOK AND SAMPLE LESSON on Courses in the Division checked below. No obligation. No salesman will call. Please check one only.

- ☐ ELECTRONICS Division
- ☐ AUTO MECHANICS Division
- ☐ AIR CONDITIONING REFRIGERATION Division
- ☐ HOME APPLIANCES Division
- ☐ HIGH SCHOOL Department

Name_____ Age_____
Address_____
City_____ State_____ Zip_____
☐ Check here if interested ONLY in Resident Training at Los Angeles.

6



Do you want HIGH INCOME with SECURITY?

Are you satisfied with your present job? Where are you headed? Perhaps you've done all right but want more out of life — you wish you could move forward. If so, now is a good time to consider getting into a high profit field as owner of a franchised MARTINIZING DRY CLEANING STORE. Get financial independence and security for your family. Enjoy the benefits of a pleasant lifetime business in the service field — a business which now numbers over 2,000 independently-owned stores from coast-to-coast in 16 years — and is still growing.

START WHILE KEEPING YOUR PRESENT JOB

A wonderful advantage of owning a Martinizing franchise is you don't have to quit your job. If you wish, you can have someone else manage your store. And when you retire you can move into a pleasant lifetime business, with a substantial income. In fact, Martinizing store owner incomes often far exceed executive salaries.

SOUND BACKING LEAVES LITTLE TO CHANCE

The Martinizing franchise was developed by Martin Equipment Sales, a pioneer in the industry and now part of McGraw-Edison (one of America's soundest, most progressive companies). No dry cleaning experience is necessary. Everything is planned for you, including selection of a store location and manager (if you prefer not to run the business directly). The complete package also covers an attractive, efficient store plan, installation of equipment, and the industry's largest, year 'round advertising program.

SUCCESS STORIES BY THE HUNDREDS

West Virginia man: "Started one store in 1955 — now own 20" . . . California franchise owner: "Doubled my income the first year" . . . Ex-Air Force Officer, South Carolina: "Best franchise business available today" . . . Former business manager, Georgia: "Martinizing has been good to us and we enjoy a fine living from it."

GOLDEN OPPORTUNITY FOR YOU

Martinizing stores are suited to every type of community or location and are proven profit-makers. The initial cash requirement is about $10,000. If this sounds good to you — if you would like high income with security, send today for more details.

ONE HOUR "MARTINIZING" CERTIFIED THE MOST IN DRY CLEANING — IFA

© Certification Mark Reg. U.S. and Canadian Trade Marks Off.

FREE BOOKLET

Colorful illustrated "Key To Success" booklet tells you all about One Hour Martinizing franchise — what it can mean for you. Send today. No cost. No obligation.

Fill Out with NO OBLIGATION

Martin Equipment Sales, Dept. PM-5
2005 Ross Ave., Cincinnati, Ohio 45212

With no obligation mail me your illustrated "Key To Success" booklet that explains how I can achieve financial security with a One Hour Martinizing franchise.

Name_____ Age_____
Address_____
Occupation_____
City_____ State_____

CLEAN YOUR CARBURETOR QUICKLY AND COMPLETELY

With GUMOUT and the easy-to-use Gumout Carburetor Clean-Out Kit, you can clean your carburetor right on the engine the fast, professional way. Or, simply add GUMOUT to your gas tank. It cleans as you drive. Get GUMOUT at your favorite service station or auto supply store.

GUMOUT

Cleveland, Ohio 44104

Spotlight on Sunbeam's Tiger

(Continued from page 44)

pine seat and wheel as through the Tiger's. You could drive over a check and recognize whether the signature was phony. But while the Alpine felt as if it was dancing across the bumps, the Tiger seemed to ram through every one with brute power. Much of that is due to the even harder Tiger suspension system.

Further, the Tiger is heavier overall, with an extra 100 pounds on the front wheels. The extra weight was held to that figure by moving the Ford engine back five inches, shifting the battery from under the rear "occasional" seat to the trunk, and laying the spare down under the trunk floor instead of standing it against the wall. Moving the engine back, combined with the use of the bigger Ford transmission, chops the already scant foot room even more. Norma, who started driving a combine in Minnesota when she was 14, still could learn the rudiments of the heel-and-toe operation, but my shovel-shaped feet were a handicap.

How about performance? Here are our accelerations:

	0–60	*40–60*	*50–70*
Alpine	13.8 secs	7.8 secs	9.7 secs
Tiger	8.6 secs	4.2 secs	5.2 secs

Overall, the Alpine got 22.9 mpg and the Tiger 17.95. As you get used to the action of either car, you should settle down enough to do better. Particularly if you avoid the performance tests we tried.

Here, for comparison, are the steady speed fuel figures and corresponding speedometer readings for the two cars:

True mph	*30*	*40*	*50*	*60*	*70*
Alpine	31.46	29.85	29.31	24.48	21.56
Ind mph	27	36	25.5	54	63
Tiger	29.23	28.25	25.68	24.93	22.33
Ind mph	32	44	54	65	76

You'll note the Alpine speedometer was, surprisingly, reading slow. It was probably the fault of the snow tires on the rear.

Brakes were good on both cars. The required pedal pressure for a hard stop climbed only from 28 to 33 pounds on the Alpine, from 32 to 39 on the Tiger. Both sets felt solid and reliable.

How about the feminine reaction to this snarling Sunbeam? I was told, "I'm a little afraid of it—it's like riding a horse that wants to run away with me—it's all ready and waiting to be let go."

That's a good distillation of the difference. If it's a difference you want, and you want it $1100 worth, a Tiger could make a nice new pet. ★★★

Wow. Want better luck the next time you paint?

This is the last stage in paint deterioration.

It's time to repaint. But why use a paint that may let *this* happen soon again?

Your house always generates ordinary moisture (appliances, showers, cooking all cause moisture). That moisture tries to get out through your paint job. Ordinary oil-base paints won't *let* it out. You get blistering, then the kind of peeling you see in the picture (and on your house?).

Du Pont Lucite® House Paint lets the moisture out without letting any water penetrate *in* when applied over bare wood. It also dries far faster than oil-base paints, holds its color much longer, goes on without a priming coat (except for spot priming bare places), goes on over damp surfaces (just after a rainstorm, for instance), goes on over wood, masonry, stucco—any surface—and cleans up with just soap and water.

Less work, more wear.

The name is Du Pont Lucite House Paint.

DU PONT

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

Less work . . . more wear

SMOOTH MELLOW FLAVOR

Blended with flavorful Maple and Old Rum

So gentle to your taste

aroma everybody loves

Mapleton

aromatic pipe tobacco

Mixture

UNITED STATES TOBACCO COMPANY

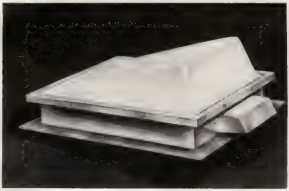
New on the Market

Keep Hot or Cold Drinks within easy reach while you drive. This aluminum rack, which clamps to the bottom lip of the dashboard, holds vacuum bottles up to 1-qt. size. No drilling required for installation. Retails for $2.98 postpaid, from Falcon Products, Inc., P.O. Box 331, 27 Okeechobee Road, Hialeah, Fla.

Translucent Skylight has built-in 90 c.f.m. ventilating fan that makes it ideal for use in bathrooms and laundry areas. Dome is made of acrylic plastic. Frame is aluminum with polystyrene insulation, and has a nailing flange for easy installation. Measures 24x32 in., costs about $100. American Cyanamid, P.O. Box 350, Wakefield, Mass.

You Can Improve Footing on stairs, loading ramps, catwalks and the like with Saf-T-Flor. This granular material applies with a trowel or stiff brush to concrete, steel or wood. A gallon ($10.75) covers about 50 sq. ft. with a $\frac{1}{16}$-in. coating. Made by the Consolidated Paint & Varnish Corp., East Ohio Building, Cleveland, Ohio 44114

Economical Patio Awning kit (below and at right) is intended for do-it-yourself installation. Frame and poles are galvanized steel. Awning is canvas. Comes in eight colors and patterns, and sizes from 10x10 to 10x40 ft. Priced at $84.95 to $319.95. Patiomaker kits available from the Jensen-Lewis Co., 156 7th Ave., New York, N.Y.



What makes Rivet-All™ the fastest, surest hand riveter 5^{29} ever bought?

New swivel head!

Take a close look at that head. The new Rivet-All Riveter has an exclusive attachment that lets you change rivet sizes at the flick of a finger. (Accommodates 1/8", 5/32", 3/16" dia. rivets.)

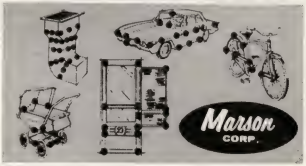
That's what makes Rivet-All the fastest, easiest, surest riveter you can buy. Just slip a rivet in it, squeeze the handles — that's it! You've got a strong, neat professional joint in just about two seconds.

Rivet-All is ideal for countless household repairs and workshop projects from antennas to vacuum cleaners . . . appliances to storm windows . . . license plates to upholstery.

So come on in to your hardware dealer and try out "the plier that rivets everything".

Smartest move you ever made.

Hundreds of uses! Bicycles, carriages, toys, metal furniture, storm doors and windows — and countless other household and workshop projects.



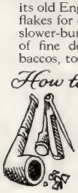
130 Crescent Avenue • Chelsea, Mass.

BOND STREET

The Pipe Tobacco that stays lit!

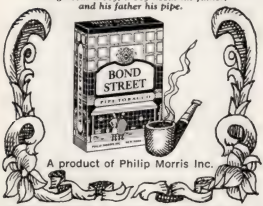
Bond Street keeps burning because of its old English cut—a combination of flakes for even-burning and cubes for slower-burning. You'll like its aroma of fine domestic and imported tobaccos, too.

How to scrape your pipe



Carefully. Use a reamer and scrape so you cut only the carbon, not the briar. One way to stop superficial caking from forming is to scrape the bowl several times a week.

A dog needs a boy, a boy needs his father, and his father his pipe.



A product of Philip Morris Inc.

Start Your Own Profitable Rug Cleaning Service

Here's ideal way to start in business for yourself without a big investment. You don't even need a shop or office. Work out of your own home, use your present car. You clean rugs new professional way in homes and offices. Start in sparetime—and graduate to full time.

FREE Booklet Tells How

Send for free "Business of Your Own" booklet! It tells the complete story about this profitable service business—lets you decide for yourself. Write today! No salesman will call.

Foley Care, Dept. 502-5
3332 Fifth St. N.E. Mpls., Minn. 55418

Items from All Outdoors

The comfort cult has come to camping in full force, a trend that we have been following with some trepidation and considerable amazement. This change was best explained by Oscar Godbout, outdoors columnist for the New York Times. "For every three men who view the world through leaky canvas," he wrote, "there are two women urging him to do something about it."

Fishermen have been inquiring about the "Texas Hootie," a lure we described in the March issue (*Want to Be a More Compleat Angler?* page 110) as resembling an old mop. You can get full information from Bob McCarty at Mathew's Sportsman Hdqtrs., Box 426, Port Aransas, Tex.

College students can now get physical education credit for a canoe trip into Superior National Forest in northern Minnesota. Sponsored by Ely Junior College in Ely, Minn., a course of instruction in woodsmanship, cooking, first aid and woods survival is available for anyone over age 16. All equipment is furnished by Canadian Waters, Inc., an outfitter famous in the north country.

Something different in outdoors adventure is a safari into the remote jungle that borders Brazil and British Guiana, an area accessible only by air. Once you have landed in the country you set up housekeeping in a mud hut and spend your vacation panning for diamonds. The trips are arranged by Diamond Safari International, Elm Grove, Wis.

Most handbooks on fishing seem designed to convince the angler that the experts are only expert at putting common sense into ponderous rhetoric. A refreshing change is Dick Wolff's *Fishing Tackle and Techniques*. In straight-forward, informative terms this book thoroughly evaluates reels, rods and lines and explains (with line drawings) their uses, care and upkeep. There is a chapter on how to fight fish that will send any novice to water with a feeling of confidence. It is available in paperback for 50 cents from Popular Library, 355 Lexington Ave., New York, N.Y.

STUART JAMES
Outdoors Editor

The ultimate total performance car— Ford GT!

Brakes clamped full on, the fabulous Ford GT slows for a corner in the Daytona 2000-kilometer endurance classic. In 12 hours and 27 minutes of savage punishment it out-braked, out-handled, out-sprinted Europe's and America's greatest entries. On the toughest proving ground of all it proved itself the world's ultimate road car.

The car it inspired— new Mustang GT!

Here's Mustang's brilliant new package for the driver who knows what Total Performance really ought to mean. Who else delivers exhilaration like this: a 225-horsepower V-8, fueled through a four-barrel carburetor. A three-speed fully synchronized floor shift. A straight-through exhaust system. Front disc brakes. Built-in fog lamps. The cornering power of Mustang's special handling package. GT insignia on the front fenders and the new symbol of Total Performance—the GT stripe—above the rocker panels. And, inside, a custom GT five-dial instrument cluster.

That's the basic GT package. But for even lustier appetites, there's a super-option—Mustang's 271-horsepower solid lifter V-8 and the four-speed manual shift. Both packages are available on hard-top, convertible or 2+2.

Happy news—and it's all spelled out at your Ford dealer's. Take a reading. Soon!

MUSTANG

Unique Ford GT stripe—badge of America's greatest total performance cars!

RIDE WALT DISNEY'S MAGIC SKYWAY AT THE FORD MOTOR COMPANY PAVILION, NEW YORK WORLD'S FAIR

Popular Mechanics Shopping Guide

Worth Writing For

Prop problems? Selecting the right propeller for the right boat is the subject of the 20-page booklet, "From Horsepower to Waterpower." To help you get top performance, these points are discussed: what is meant by "standard" propeller, the relationship between horsepower and rpm, correct transom height, motor angle adjustment and boat loading. Copies of the booklet are free upon request from OMC Accessories, Outboard Marine Corp., Galesburg, Ill.

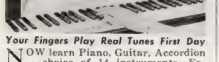
Your garden is of prime concern now. "How Does Your Garden Grow?" by Lucile Bush offers 8 pages of helpful tips for both indoor and outdoor gardeners. For example, advice for watering left-alone plants: insert one end of an old cotton clothesline in plant soil and the other end in a jar of water. The booklet is free from Johnson Wax, Consumer Education Dept. B-5, Racine, Wis.

All thumbs when it comes to tying knots? Diagrammed in red and white on heavy paper board, with matching rope, are 40 widely used knots—from the figure eight double to the tiller's hitch. Sailors, campers and those interested in keeping children's hands busy on long motor trips: send 50 cents to 2112 Linden Lane, Dept. PM, Palatine, Illinois for "Forty Knots."

"Nothing But Noise?" is the title of a 24-page booklet designed to help you stop radio frequency interference in your car, boat or plane. If signals aren't getting through on your mobile rig, you'll find in the booklet the sources of engine electrical noises and the several methods of suppressing,

(Please turn to page 56)

FREE "NOTE-FINDER"



Your Fingers Play Real Tunes First Day

NOW learn Piano, Guitar, Accordion —choice of 14 instruments. Famous PIANO "Note-Finder" FREE. Play real music by note—even if you don't know a single note now. FREE HOOK describes proven Course that has you playing right from first lesson. Write today to **U.S. SCHOOL OF MUSIC, Studio A305, Port Washington, L. I., N. Y. 11050.** *(Est. 1898. Lic. N. Y. State Educ. Dept.)* No salesman will call. Tear out.

TURN YOUR TIME INTO CASH SHARPENING!

Be secure, own your own business, nobody can lay you off! Housewives, hobbyists, barber shops, restaurants, hardware stores, hospitals, farmers, tool rentals—everybody needs sharpening service. Hollow grind scissors, pinking shears, knives, saws, planer blades and tools. Spare or full time. Factory-to-You. Write for Free Booklet.

TREYCO Products Corp.
381 Niagara St., N. Tonawanda, N.Y.

ROBLINGER PMC® STAINLESS STEEL FOIL—SHIM

PRE-MEASURED . . . CALIBRATED
AISI TYPE 302—SPRING TEMPER
USED IN HOME-LAB-INDUSTRY

PER PKG.—WDTH 6"x60" LGTH			
.0005"	$18.70	.006"	$5.60
.001"	13.65	.007"	5.75
.002"	6.30	.008"	5.85
.003"	6.10	.009"	5.95
.004"	5.85	.010"	6.05
.005"	5.45	.015"	7.00

CHECK WITH ORDER P.P. PRPD.-No. COD

N. E. SLAVIN & CO.
297 3rd ST. CAMBRIDGE, MASS.

ONLY $14.95

Money Back Guarantee **HEAVY DUTY-ARC WELDER** Five Year Guarantee

The New 1965 Model Heavy Duty 110 Volt Arc Welder works on any 110 volt house line. You can not buy a better welder anywhere in this low price. No experience necessary. Now anyone can braze, solder, cut and weld any metal up to 1/4" thick. Generates heat up to 10,000 degrees for cutting through steel plate, etc. **NOTHING ELSE TO BUY.** Comes complete with 12 ft. of heavy duty power cable, 1 1/8" and 1/4" welding and brazing rods, rod holder, twin carbon, torch, helmet, instruction book, etc. **MONEY BACK GUARANTEE.** Try it for 10 days, if you are not completely satisfied we will immediately refund your money without question.—**FULLY GUARANTEED FOR FIVE YEARS.** If inoperative, we will repair or replace it free of charge. **SEND ONLY $2.00,** and when delivered, pay postman $12.95 plus COD postage, or send $14.95 and we will ship postpaid. Over 10,000 National Electric Welders are in use throughout the world.

Order Direct from factory: NATIONAL ELECTRIC, Dept. PM-5, DELRAY, FLORIDA

5 Day Home Trial

WORLD'S LARGEST DEALER

"NEW SOUND" ACCORDIONS-SAVE ½*

42 NEW ELECTRONIC/STANDARD MODELS
*SAVE 1/2 off retail prices of comparable accordions! 42 exciting new models—Standard, ELECTRONIC, Amplifiers, too! All famous makes. Try before you buy. Free Accessories. E-Z Terms. Trade-ins. Lifetime Performance Policy. Money back guarantee. FREE Color Catalogs and Importer-to-You Discount Prices. Rush coupon.

ACCORDION CORP. of AMERICA, Dept. R-55
5535 W. Belmont, Chicago 41, Illinois

Accordion Corporation of America, Dept. R-55
5535 W. Belmont, Chicago 41, Ill.
Send FREE Catalog of Accordions, Amplifiers—Discount Price List.

FREE New Color Catalogs—Discount Prices

Name____
Address____
City____State____
☐ Check here if you have Trade-in

1965 JET CONTROL BLACK LIGHT INSECT TRAP DESTROYS FLYING INSECTS INCLUDING FLIES AND MOSQUITOES!!!

*50,000 UNITS NOW BEING USED Anywhere from Multiple Acre Farms and Ranches to Backyard Patios and Gardens

- **Powerful 1/100 H.P. Motor renders approaching insects powerless and pulls them into the trap.**
- **Sylvania 10" 22 Watt Black Light attracts moths, flies, gnats, mosquitoes and other flying insects.**
- **All weather unit offers full 360 degree range.**
- **Operates electrically for pennies per month. • No chemicals • No work**
- **No spraying or dangerous odor. • Perfect for motels • Shopping Centers**
- **Restaurants • Drive-Ins • Dairy Barns • Service Stations • Farms and Homes**

The All New Jet Control Black Light Insect Trap is one of the most powerful of its kind on the market today. Actually catches harmful insects and has proved effective over various areas from back yard patios and gardens to multiple acre farms and ranches. Sylvania 10" 22 Watt Black Light draws from grass, gardens, foliage and shrubbery killing some adult insects before eggs are laid. (At the height of its mating season). Its powerful 1/100 H.P. Motor is twice as powerful as competitive models. (Most others have 1/200 H.P. Motors) and its jet control principle actually, permanently pulls the insects into the bag with such force (Creating a wind tunnel of over 1175 Cubic feet of air per minute suction) that even powerful flies and mosquitoes are powerless against it. Ruggedly constructed of corrosion free baked enamel to insure years of trouble free operation. Shipped complete with hanging bracket, reusable fabric bag and 6 ft. of weatherproof, outdoor cord. U.L. Approved, weighs a solid sturdy 7 lbs., 10" high x 9" diameter. Formerly $34.95 . . . Now only $19.95 plus $2.00 safe handling delivery charge.

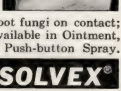
*50,000 units have been sold by our firm during the past 2 years and we've received numerous letters of praise and testimony regarding the amazing claims of performance of this product, including a feature story in a midwestern newspaper. All are on file for your inspection or write for a reprint of the letters, and the article including a notarized statement regarding the above.

Formerly $34.95
Now only
$19.95
Plus $2.00 P.P. & Hd. & Ins.

(If COD $5 dep., Fees Extra) MONEY BACK GUARANTEE

SCOTT MITCHELL HOUSE Dept. PM-565 415 South Broadway, Yonkers, N. Y.

How To Stop Athlete's Foot Itch



At first sign of itching, cracking, peeling between toes, apply Dr. Scholl's Solvex for fast relief! Amazing medication works three ways: **1.** Stops the intense itching; **2.** Kills Athlete's Foot fungi on contact; **3.** Promotes healing! Available in Ointment, Liquid and Powder or Push-button Spray.

Dr. Scholl's SOLVEX®

ELECTRONICS

COYNE ELECTRONICS INSTITUTE

A quarter million dollars worth of equipment. Non-Profit Institute—Est. 1899. Courses: Electronics • Electricity • TV-Radio • F.C.C. • Electronics Engineering Technology. Mail coupon or write for FREE BOOK, "Your Opportunities in Electronics." No Salesman will call.

COYNE ELECTRONICS INSTITUTE Educ. Serv. Dept. 55-S
1501 W. Congress Parkway, Chicago, Ill. 60607

NAME_____ PHONE_____
ADDRESS_____ AGE_____
CITY_____ STATE_____

AUTOMATIC TRANSMISSION SPECIALISTS MAKE BIG PAY!

NEW 1965 MANUAL QUALIFIES YOU

Now you can learn diagnosis, adjustment, repair and complete overhaul of all Automatic Transmissions—right in your own home or shop. Covers all current models. Qualifies you for expert service AND the HIGH PAY this exacting work requires. Write for full particulars or order now. Fill in coupon and mail today.

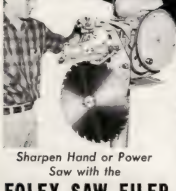
Expert Diagnosis Adjustment and Repair Instruction.
•
Covers ALL current Makes of Transmissions
•
Clear and Thorough. Contains over 1100 pages and thousands of illustrations.

SEND NO MONEY • 10 DAYS FREE TRIAL

Lincoln Technical Institute, Suite E-5
472 Market St., Newark, N.J. 07105
Please send full information on Lincoln Tech's New Automatic Transmission Manual.
Name_____
Address_____
City_____ State_____

START A BUSINESS

in your neighborhood



Sharpen Hand or Power Saw with the

FOLEY SAW FILER

MODERN MOWER SHARPENER
Precision-grind all hand and power lawn mowers—a perfect job every time.

Start your business in sparetime and make CASH PROFITS right away. No stock to carry, no selling involved, no experience needed —the Foley Saw Filer does every sharpening job **automatically!** Earn $3 to $6 an hour sparetime in your own garage or basement. Profit 90c on every dollar.

Best of all, every saw you sharpen, will be resharpened again and again—watch your repeat business grow! Add cash to your income now, while you build retirement security with the Foley Saw Filer.

FREE BOOK shows how you can make money as thousands of others have. Send coupon today. There's no obligation, and no salesman will call—so write today!

Foley Manufacturing Co.
516-S Foley Bldg., Minneapolis, Minn. 55418
Send for FREE book on Money-Making facts about the sharpening business.

NAME_____

ADDRESS_____

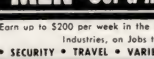
CITY_____ STATE_____ ZIP CODE_____

•MEN• Get a man's Job!!!

Earn up to $200 per week in the Construction or Trucking Industries, on Jobs that Offer:

• SECURITY • TRAVEL • VARIETY • OUTSIDE WORK

DRIVING



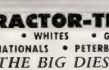
TRACTOR-TRAILERS

• MACKS • WHITES • GMC'S • KENWORTH
• INTERNATIONALS • PETERBILTS • DIAMOND T'S

"THE BIG DIESEL RIGS"

OR

OPERATING



• BULLDOZERS
• SCRAPERS
• GRADERS
• BACK HOES
• DRAG LINES
• CLAM SHELLS

HEAVY EQUIPMENT

Short practical training program will qualify you for one of the job openings in these rapidly expanding Industries. For complete information Send Name, Address, Age, Phone Number and Working Hours to

ASSOCIATED HEAVY EQUIPMENT SCHOOLS, INC.
1141 NE 79th STREET, MIAMI, FLORIDA 33138

START YOUR OWN MONEY MAKING BUSINESS

Clean rugs on customers' floors — upholstery in their homes — even painted walls — with highly efficient electric machines which are making big money for others and giving them independence. Write today for complete information. It's FREE!

VON SCHRADER MFG. CO., Dept. 510 "R" PL., Racine, Wis.

GET INTO ELECTRONICS

V.T.I. training leads to success as technicians, field engineers, specialists in communications, guided missiles, computers, radar, automation. Basic & advanced courses. Electronic Engineering Technology and Electronic Technology curricula both available. Assoc. degree in 24 mos. B.S. obtainable. G.I. approved. Start Sept., Feb., Dorms, campus. H.S. graduate or equivalent. Catalog.

VALPARAISO TECHNICAL INSTITUTE
DEPARTMENT D. VALPARAISO, INDIANA

Homeowners waiting to buy!

They want bird baths, urns, patio stone, other ornamental items you can make of

GARDENCRETE

Earn profits of 200%-300% — with low-investment Gardencrete operation. Sell easy-to-make masonry products to nurseries, florists, garden centers, or homes. Free "Gardencrete" Book. Write.

Make dozens of different lawn and garden items.

W. E. DUNN MFG. CO., 710 West Ottawa St., Holland, Mich.

LEARN MEAT CUTTING

Train quickly in 8 short weeks at Toledo for a bright future with security in the vital meat business. Big pay, full-time jobs — HAVE A PROFITABLE MARKET OF YOUR OWN! Pay after graduation. Diploma given. Job help. Thousands of successful graduates. Our 42nd year! Send NOW for FREE catalog. No obligation. GI approved.

NATIONAL SCHOOL OF MEAT CUTTING, Dept. 50-U, Toledo 4, Ohio

75 POWER TELESCOPE 25X-45X-75X $3.98

NEW 3 in one telescope. 3 variable 25X, 45X-75X magnification. Brass bound. 25 power for ultra bright images. 45 & 75 power for long range. Guaranteed to bring distant stars, moons, objects, sports 75 times closer.

Most powerful scope sold anywhere near this amazing low price. American made. 5 sections. Opens 36", closes 1 ft.; contains 4 ground & polished lenses. Can also be used as powerful compound microscope. Mass production enables us to offer telescope complete at $3.98 postpaid. Money back guarantee.

CRITERION CO., Dept. PBM-25, 331 Church St., Hartford, Conn.

CLEANS SEWERS WITHOUT DIGGING!

Amazing M-Q Sewer Cartridges destroy roots, rags, grease, other organic matter chemically. Saves you $50 to $100 digging and cleaning costs. Harmless to plumbing, trees, shrubs. 6 for $3.30 postpaid. Send check or money order now.

MINNESOTA QUARTZ COMPANY
Mendota, Minnesota 55050

REAL ESTATE BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your **own business quickly.** Men, Women, all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, & related subjects. **STUDY AT HOME** or in classrooms in leading cities. **DIPLOMA AWARDED. Write TODAY for FREE PAYS BIG!**

FREE BOOK TELLS HOW

Accredited Member National Home Study Council (Established 1930)

WEAVER SCHOOL OF REAL ESTATE
3521-P Broadway Kansas City, Mo. 64111

TUNE UP ELECTRONICALLY ANY CAR EVER MADE...

domestic or foreign; compact or limousine; 4 cylinder, 6 cylinder or 8 cylinder; 6 volt or 12 volt.

With New Improved Model BT-162

DWELL TACHOMETER

NOTE: GIANT 6½" METER FOR EASY, ACCURATE READINGS

At last a streamlined instrument designed to provide the most important services for "tuning up" any and every car ever made from a Model A Ford up to and including the current automatic transmission cars produced today.

The Model BT-162 includes the very latest design Dwell Meter, working in conjunction with a dual range Tachometer and incorporating all modern improvements in circuitry design.

Assure easy starts, optimum performance and maximum gas economy with Model BT-162.

The Model BT-162 will perform the services specified below in addition to many other tasks too numerous to mention:

- Assure precise adjustments of points that are slightly worn or pitted.
- Indicate the most effective point setting without removing the distributor cap.
- Indicate the correct settings for external adjustment type distributors. (A feeler gauge cannot be used for making correct adjustments on this type of distributor since many manufacturers' specifications do not list the point gap in inches. They list only the dwell angle in degrees.)
- Insure maximum gas economy and quiet engine running. Read the exact RPM while the engine is in neutral position. Then adjust the carburetor in conformity with the car manufacturer's recommendations.
- To locate a "miss" you need only disconnect or "short" the spark plugs one at a time with the Model BT-162 switched to the Tachometer position.
- Cars with automatic transmissions function efficiently only if the fluid pressures are correctly maintained and since manufacturer's instructions always refer to RPM, the Model BT-162 (or an equivalent tachometer) is required to properly service automatic transmissions.

The Model BT-162 is the most complete unit in its price range ever produced. It comes absolutely complete, ready to use. Only **$29.95**

Specifications

The Model BT-162 provides three dwell angle scales; 0 to 45 degrees, 0 to 60 degrees, and 0 to 90 degrees. The three dwell angle ranges specified above make this instrument suitable for making accurate dwell angle adjustments on all 4 cylinder, 6 cylinder, and 8 cylinder cars, both foreign and domestic.

The dual range tachometer is extremely versatile since it provides both a low range of 0 to 1000 RPM, necessary for making precise carburetor adjustments and the high range tachometer, 0 to 5000 RPM suitable for making all other tests at high engine speeds.

SEND NO MONEY WITH ORDER
PAY POSTMAN NOTHING ON DELIVERY

Try it for 10 days before you buy. If completely satisfied then send $5.00 and pay the balance at the rate of $5.00 per month until the total price of $29.95 (plus small P.P. and budget charge) is paid. If not completely satisfied, return to us, no explanation necessary.

ACCURATE INSTRUMENT CO., INC.
Dept. D-409, 911 Faile St., Bronx, N.Y. 10474

Please rush me one Model BT-162. If satisfactory I agree to pay $5.00 within 10 days and balance at rate of $5.00 per month until total price of $29.95 (plus small P.P. and budget charge) is paid. If not satisfactory, I may return for cancellation of account.

Name_____

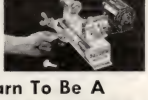
Address_____

City_____ Zone_____ State_____

☐ Save Money! Check here and enclose $29.95 with this coupon and we will pay all shipping charges. You still retain the privilege of returning after 10 day trial for full refund.

FREE Key Machine

Kind master locksmiths use. Sells for $125, but yours FREE with Locksmithing Course



You Can Learn To Be A
LOCKSMITH
in your spare time

There's a big demand for skilled locksmiths. You can earn big money either full or part-time in your own home. Be your own boss; earn steady, year 'round income with no layoffs. The BELSAW INSTITUTE training, recommended by professional locksmiths, teaches you to make keys, open and repair locks on homes, cars and buildings. Easy, step-by-step illustrated lessons complete with all tools and supplies. We tell you how to get servicing jobs, how much to charge, how to earn while you learn and how to build a secure cash profit business.

Mail Coupon for FREE Book Today!

BELSAW INSTITUTE, 105L Field Bldg., Kansas City 11, Mo.
Send FREE book, "Keys To Your Future!"
No obligation. No salesman.

Name.....
Address.....
City.....State.....

A New FREE BOOK for
MEN PAST 40

Troubled With Getting Up Nights, Pains in Back, Hips, Legs, Nervousness, Tiredness.

This new Free Book tells that if you are a victim of the above symptoms, the trouble may be traceable to Glandular Inflammation . . . a condition that very commonly occurs in men of middle age or past.

The book explains that, although many people mistakenly think surgery is the only answer to Glandular Inflammation, there is now a non-surgical treatment available.

NON-SURGICAL TREATMENTS

This New Free Illustrated Book tells about the modern, mild, Non-Surgical treatment for Glandular Inflammation and that the treatment is backed by a Lifetime Certificate of Assurance. Many men from all over the country have taken the NON-SURGICAL treatment and have reported it has proven effective.

Treatment takes but a short time and the cost is reasonable.

Write today for this New Free Book that tells **HOW** and explains **WHY** more and more sufferers are using **MODERN NON-SURGICAL** Methods of treatment. Act Now. No obligation.

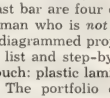
EXCELSIOR MEDICAL CLINIC
Dept. M 6153 Excelsior Springs, Mo.

filtering and shielding them. Free booklets are available from Hallett Manufacturing Co., 5910 Bowcroft St., Los Angeles, Calif. 90016.

"Tool Guide" shows you how to use over 30 basic shop tools. This booklet in handy notebook format—8½ by 11-inch 3-ringed pages—includes how-to tips for everything from the ball pein hammer to the block plane. Send 25 cents to Stanley Tools, Educational Dept., New Britain, Conn.

A gun cabinet, two-level coffee table, wall storage unit and breakfast bar are four of eight plans for the shopman who is *not* a master craftsman. Each diagrammed project includes a materials list and step-by-step directions. Added touch: plastic laminate for durable tops. The portfolio of plans costs one dollar from The Nevamar Co., Odenton, Maryland

EARN BIG MONEY!

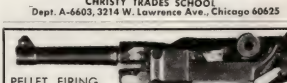


Learn APPLIANCE REPAIRING

Send for FREE BOOK!

Learn at home in your spare time how to fix electrical appliances using Christy Electronic Trouble Tracer, how to wire homes and stores, rewind motors, how to get business, what to charge. Make $5-6 per hour in your kitchen, or basement. Operate your own fix-it shop. Pay later from earnings.

CHRISTY TRADES SCHOOL
Dept. A-6603, 3214 W. Lawrence Ave., Chicago 60625



PELLET FIRING
LUGER AUTOMATIC

- MAGAZINE LOADING CLIP
- OVER 15 MOVING PARTS
- FULLY AUTOMATIC

ONLY **$1.98**

Automatic full size model of a Luger Automatic pistol —contains over 15 moving parts. Loads 8 complete rounds which snap into the hard butt simulating a Luger. Fires 8 bullet shaped pellets. Has automatic slide action.

MOST AUTHENTIC MODEL GUN WE'VE EVER SEEN

Comes to you with working parts disassembled with cleverly engineered springs, full instructions, supply of pellets and specially designed belt holster. **Full Money Back Guarantee.** Simply send $1.98 plus 27c shipping charge or order C.O.D. From:

HONOR HOUSE PROD. CORP., Dept. 96LG05, Lynbrook, N.Y.

Shopping Guide...

Cam action is explained in a concise 20-page pamphlet, "Selecting the Right Cam for Sports & Imported Cars." The down-to-earth facts on modified, "street" and competition grinds may increase your car's performance: a chart describes what each type cam will do for specific cars. Write The Weber Tool Co., 310 S. Center St., Santa Ana, California, for your free copy.

Weekend craftsmen can add warmth to any room in the house, whether it be colonial or contemporary, with wood. Two pamphlets from Western Wood Products Assoc., 526 American Bank Building, Portland, Oregon, not only suggest a number of intriguing ways to handle wood paneling, but also give you the how-to-do-it information you need. Fifteen cents will secure you the two booklets: "Weekend Walls in Western Wood Paneling" and "What You Can Do With Paneling."

Two of four-wheel drive JEEP or SCOUT owners

REPOWER
with V-8 or 6 Cyl. engines. H.D. ADAPTORS for TRUCK, CAR or COMPACT engines. Immediate del. Write, wire or phone TODAY. Free details.
HOOSIER MACH. Prods. Co.
312 SE 8th Pendleton, Oregon
Ph. 276-3442

EXCLUSIVE DOUBLE-BEARING
HEAVY DUTY PUMPS
IRRIGATE • DRAIN • CIRCULATE • SPRAY
Use ¼ HP motor or larger . . . 1 HP for up to 5,200 GPH; 1,000 GPH 60' high; or 3,000 GPH from 25' well. 1¼" inlet, 1" outlet. stainless shaft.
TYPE K—2 oil-less bearings. Won't leak, lubricate . . . $10.95
TYPE XB—Ball bearing model. . . . $12.95
Best for belt drives . . .
Postpaid if cash with order.
Don't delay—send for yours today!
MONEY BACK GUARANTEE
Centrifugal and Gear Pumps in All Sizes
LABAWCO PUMPS, Belle Mead 2, N. J.

NOW! WARN OVERDRIVE gives 'Jeeps' more Go!

New approved accessory cuts engine RPM 33% at any speed, reduces noise, vibration so you can drive your Jeep 4-w.d. comfortably at freeway speeds. Amazing synchromesh OD lets you shift up or down, on the go, anytime, in any gear, at any speed. Adds six forward speeds, two reverse. At Jeep dealers, or write us.
WARN SALES CO., Inc.
9050-A Empire Way South
Seattle, Washington 98118

Own a Business

You now have an opportunity to double your income in your own business. A big 24-page book tells how others start in spare time—then expand to a full time operation. Gross hourly profit $9.00—PLUS $6.00 additional on each service man. Income unlimited.

In this business your service is Nationally Advertised. It's a business that's world-wide and endorsed by McCall's and Parents' Magazine. Exclusive *absorption* process cleans *and revives* upholstery and carpets, also 5 other on location services.

You need no experience—no shop. We show you how and finance you for all but a few hundred dollars. Easy to learn—easy to do—easy to build up to a good, steady volume on our 15 tested ways to get customers.

G. F. Monroe, after 12 months, sold his business for 10 times his cost. Leo Lubel sold his for $7,116 more than he paid. L. Babbit writes, "I average $2,600 monthly, part time." W. C. Smith earned $650 in one week. Ed Kramsky said, "In two years I have two assistants, a nice home and real security."

This may be the opportunity of your life. **Find out today** before someone else gets your location. Mail the coupon now for full details and 24-page illustrated free book. No obligation. No salesman will call. Mail coupon now before it's too late to get territory.

DURACLEAN COMPANY
5-165 Duraclean Building, Deerfield, Illinois 60015
Please send me your 24-page illustrated book that tells how I can double my income in a business of my own. Everything you send me now is free and I am under no obligation. No salesman will call.
NAME
ADDRESS
CITY
STATE ZIP CODE

LAFAYETTE RADIO ELECTRONICS
FREE! 1965 CATALOG NO. 650
516 Pages from the "World's Hi-Fi & Electronics Center"

Hi-Fi Stereo • Citizens Band • Ham Gear • Test Equipment • Cameras • Tools . . . just about Everything in Electronics for Home, Industry and Laboratory.
Mail the Coupon for Your Free Catalog!
Lafayette Radio Electronics
Dept. LE-5, P.O. Box 10 Syosset, L.I., N.Y. 11791
Send me the Free 1965 Lafayette Catalog 650.
Name
Address
City State Zip

PLAY GUITAR IN 7 DAYS
OR MONEY BACK
TOP GUITARIST ED SALE'S famous 66 page secret system worth $3.00 teaches you to play a beautiful song the first day and any song by ear or note in seven days! Contains 52 photos, 87 finger placing charts, plus 110 popular and western songs, (words and music); a $1.00 Chord Finder of all the chords used in popular music; and a $3.00 Guitarist Book of Knowledge.
TOTAL VALUE $7.00 —ALL FOR ONLY $2.98
SEND NO MONEY! Just your name and address, pay postman: $2.98 plus C.O.D. postage. Or send $3.00 with order and I pay postage. (Sorry, no C.O.D. outside Continental U.S.A.—please remit with order.)
Unconditional Money-Back Guarantee
ED SALE, Studio 153-H AVON BY THE SEA, N. J.

when it's time to think of college you should read this

FREE CAREER BOOKLET

about engineering at

MSOE

MILWAUKEE MS-236
SCHOOL OF ENGINEERING
Dept. PM-565, 1025 N. Milwaukee Street
Milwaukee, Wisconsin 53201

Tell me about an engineering career through residence study in:

☐ Mechanical fields ☐ Electrical fields

Name.....Age.....

Address.....

City, State.....

EARN MONEY FAST!

REPAIR HYDRAULIC JACKS

Earn while you learn at home. Trained and qualified mechanics needed NOW to service inoperative hydraulic jacks. BIG opportunity for ambitious men. We show you HOW — in your basement or garage, spare time cash income in an expanding industry. Don't wait, ACT NOW! Get the facts.

Write for folder No. PM5 and free bonus offer

HYDRAULIC JACK REPAIR MANUAL CO.
P. O. BOX 50 • BLOOMFIELD, N. J.

YOU can build and fly

the one-man Bensen Copter

Enjoy this modern sport as others like you are doing in many parts of the world. Designed by aeronautical engineers, the Bensen Copter is fun to build, easy and inexpensive to fly. Professional pilots and novices alike acclaim it. Ultralight, portable, lifts up to 500 lbs. Plans and kits available. 3-View Drawings, specs, photo of Gyrocopter $2 or Gyroglider $1. Order today!

Send $1 or $2

BENSEN AIRCRAFT CORP., Dept. PM-55
Raleigh-Durham Airport, Raleigh, N. C.
NAME.....
ADDRESS.....

HOME-IMPORT BUSINESS—Make Big Profits

New Drop Ship Plan offers you first day profits! Deal direct with overseas sources at prices shown. Dazzling bargains with no investment. Full or spare time. Write for FREE BOOK today to . . .

MELLINGER, 1354 S. Sepulveda, Dept. P255, Los Angeles 25

At Last a New Amazingly Simple

GAS TURBINE JET ENGINE

Build from easy to follow plans. Length 15", Dia. 8½", Wt. 15 lbs. Fuel: Gasoline or Kero.

"Screamin Demon" develops 20 H.P. Ideal project for serious-minded hobbyists, students; scientific and industrial arts classes. Make on 9" metal cutting lathe with milling attachment. For use on small racing boats, midget cars, etc. Full size assembly drawings with critical dimensions, bill of materials and photos. **Price $5.00. No C.O.D.**

SAVOY SCIENTIFIC, BOX 1398, SANTA MONICA, CALIFORNIA

SAILBOAT KITS

Send for free complete color catalog of popular Snipe, Windmill, and Blue Jay sailboats and accessories. Also cruisers, runabouts, catamarans, hydrofoils, etc.

TAFT MARINE WOODCRAFT
Dept. PM-5, 636 39th Avenue N.E.
Minneapolis, Minnesota 55421

DON'T BE BULLIED!

Learn direct from the Orient, CHINESE KUNG-FU KARATO, the secret OCCULT Art of Self-Defense, so effective even a Judo-Karate expert respects it. Defeat aggressors within seconds. Size Doesn't Count! For Free Details by Air: rush your name and address also by Air to Asia's Greatest Karato Master:—

HONOURABLE MASTER LEONG FU, Dept. M1/10, 119, Anderson Road, IPOH, MALAYSIA.

---

640 ACRES OF WILDLIFE - $20

$20 plus $6.00 taxes yearly gets you a private retreat on a mile-square untamed wildlife paradise near Canadian border. Thousands of acres of abandoned leaselands and forfeited grantlands now for sale or lease, some with rivers and private lakes, accessible by road, teeming with wildlife, including bear, moose, deer, muskie, northern pike, ducks, geese. Send $1 (refundable) for instructions, maps, pictures, Gov't regulations, application blank, to: Director, O.S.C.A., Room 594, 56 Church, Toronto 1, Canada. (Add 50¢ for special handling rush air mail.)

Excitement! Security! Good Pay!

CRIME DETECTION

LEARN AT HOME IN SPARE TIME—START NOW!

Crime everywhere is on the rise! Learn now, in your own home, the profitable profession that enables you to track down criminals and bring them to justice! Hundreds of Identification Bureaus employ I. A. S. graduates . . . trained in finger printing, police photography, handwriting identification, firearms and investigation. Our 44th year! **FREE** "Blue Book of Crime" . . . packed with crime facts and the full story of famous I. A. S. training. State exact age. No salesman will call. Rush Coupon.

A Correspondence School Founded in 1916.

FREE Blue Book of Crime

MAIL COUPON

INSTITUTE OF APPLIED SCIENCE, Dept. 1355
1920 Sunnyside Avenue, Chicago 40, Ill.

Rush Blue Book of Crime . . . FREE!

NAME.....AGE.....

ADDRESS.....

TOWN.....STATE.....

Here's the "STRAIGHT DOPE" on

HOW YOU CAN FIX 2,341 CAR MODELS

from the Men Who Build 'Em!

Engineers from every American car factory put their know-how at your fingertips in this giant 1,325-page picture book!
COVERS ALL THESE MAKES — 1958 thru 1965!

Buick · De Soto · Jeep · Plymouth · Cadillac · Dodge · Lincoln
Pontiac · Chevrolet · Edsel · Mercury · Rambler · Chrysler · Ford
Falcon · Studebaker · Corvair · Dart · Oldsmobile · Thunderbird
Continental · Imperial · Valiant

plus Buick Special, Comet, Corvette, Lancer, Rambler American, Tempest, Chevelle, Volkswagen, more!

BRAND-NEW EDITION!

TRY BOOK FREE FOR 10 DAYS!

No guesswork. Clear pictures show how to fix starting motors, generators, brakes, power steering, etc.

All Automatic Transmissions are fully covered in special big section. (NOTE: All pictures shown here greatly reduced in size. Actually this giant book is almost a foot high!)

Diagrams, tables and text take the "mystery" out of all ignition systems.

Now — the "meat" of 300 shop manuals makes practically any car repair or service job child's play for beginner or expert mechanic!

NOW you can "breeze thru" the toughest car repair jobs – in DOUBLE-QUICK time. If you're a beginner mechanic you can tackle jobs you never dreamed you could handle. And if you're already an expert, you'll save yourself hours of back-breaking work . . . and save money, to boot!

It's easy with the big brand-new Edition of famous MOTOR'S Manual. You get the expert help of 300 Official Factory Shop Manuals – the time and work-saving methods developed by factory engineers in every auto plant in America for their own motor car lines–boiled down in one handy, indexed book.

Factory Experts Practically Guide Your Hands

NO guesswork! NO false starts! MOTOR'S Manual starts you from "scratch" – expert "know-how" guides your hands through *every* step of practically *every* job. With clear illustrations and 1-2-3 instructions, these experts show you how to "polish off" just about any repair on any car listed – 1958 thru 1965 – *including all the new "in-between" models.*

NEW, REVISED Edition gives you exactly what you need to know to repair 2,341 models. Over 1,300 Giant-size pages. 3,800 "This-Is-How" pictures and diagrams. 457 "Quick-Check" Charts. 55,000 Essential repair specifications, 225,000 Service and Repair FACTS. Instructions and pictures so clear you CAN'T go wrong!

Here's how to make fast, expert repairs on Automatic Transmissions, Engines, Ignitions, Carburetors, Steering Gears, Generators, Alternators, Distributors, Power Steering and Brakes, Starter Motors, much, much more. No wonder well over 5 MILLION copies have been sold. No wonder it's used by the U.S. Armed Forces, thousands of schools!

Try It FREE 10 Days

SEND NO MONEY! Just mail coupon. (Paste it to a postcard for faster action.) Use the Manual for 10 days, *free*. If you don't agree that it is the greatest time-saver and work-saver you've ever seen–return book in 10 days, pay nothing. Mail coupon today! MOTOR Book Dept., 250 West 55th St., New York, N. Y. 10019. *(Schools, Bookstores: Write for discounts.)*

GREAT HELP FOR STUDENT. "Motor pulled me out of some rough spots in high school and even now. At present, I'm in the Armed Forces attached to the motor pool."
—W. Bokemorer, Missouri (Apprentice)

CLEARS UP 'MYSTERIES'. "I always rely on Motor when I do a repair I am not familiar with. Well illustrated, complete, simple."
—E. Jones, Minnesota (Shop Owner)

Same Offer on MOTOR'S Revised AUTO ENGINES & ELECTRICAL SYSTEMS

1,300 Big pictures. Clear text explains how parts work; principles involved; design; construction; maintenance. Covers all parts of engines & entire electrical system. For FREE trial, check coupon.

MAIL COUPON NOW FOR 10-DAY FREE TRIAL

MOTOR BOOK DEPT., Desk 515
250 W. 55th St., New York, New York 10019 ★

☐ Rush to me at once **MOTOR'S NEW AUTO REPAIR MANUAL.** If O.K., I will remit $2 in 10 days, $3 monthly for 2 months and a final payment of $1.95 (plus delivery charges and sales tax, if any) one month after that. Otherwise I will return the book postpaid in 10 days.

Print Name.....Age.....

Address.....

City.....State.....Zip Code.....

☐ Also send me for 10 days' Free Trial **MOTOR'S Revised AUTO ENGINES and ELECTRICAL SYSTEMS.** If O.K., I will remit $3 in 10 days, $2 monthly for 2 months, and a final payment of $1.50 (plus delivery charges and sales tax, if any) one month after that. Otherwise I will return book postpaid in 10 days.

☐ **Check box and save** shipping charge by enclosing WITH coupon in envelope entire payment of $9.95 for Auto Repair Manual (or $8.50 for Auto Engines & Electrical Systems) plus sales tax, if any. Same 10-day return-for-refund privilege applies.

START A MONEY-MAKING BUSINESS FOR LESS THAN $50!

You can have your own lifetime business right at home . . . work in spare time . . . and make up to $200 a month CASH! My FREE PLAN gives you all the facts: How to start, how to grow. You don't need previous experience. You don't have to sell. I'll even finance you. People bring you the work and pay cash. Over 90c of every dollar you collect is clear cash profit. And you work when you want to. Let me prove you can't find a more certain, lower cost, higher paying business of your own.

FREE BOOK

Just Mail Coupon—No Salesman Will Call

BELSAW SHARP-ALL CO., Stan Field, President
715L Field Bldg., Kansas City, Mo., 64111

Name_____
Address_____
City_____ State_____

ALUMINUM SIDING

Learn how you can earn up to $1000.00 per sale, showing our quality aluminum siding on your home.

TO: ALUMINUM INDUSTRIES, Dept. P-55
KANSAS CITY 11, MISSOURI

Please send me complete information

My Name_____
Street_____
City_____ State_____

MAKE MONEY WRITING

...Short Paragraphs! Hundreds of beginners now making money writing short paragraphs. I tell you what to write, where and how to sell; and supply list of editors who buy from beginners. No tedious study. Write to sell, right away. Send for free facts. **BENSON BARRETT, Dept. 27-E, 6216 N. Clark St., Chicago, Ill. 60626**

be a TAX CONSULTANT

Income unlimited in ever growing profession. Our students are earning lucrative fees in dignified full or part time home-office business preparing income tax returns during busy tax season. Many operate profitable Business Tax Service with steady monthly fees all year. No bookkeeping experience necessary. We train you at home and help establish practice. Accredited. Education Dept. No agent will call. Write for free literature. Accredited Nat'l Home Study Council.

National Tax Training School, Monsey, A-20, N.Y.

Career in ELECTRONICS?

Train at home with RCA Institutes, one of America's leading Electronic Schools. Lab work with first lesson. No installment payments required. (Licensed by N. Y. State Education Dept.) Send for free 64-page book.

RCA Institutes, Inc.
A Service of RCA
Dept. PM-55
350 W. 4th St., N.Y. 14, N.Y.

HELP WANTED—SPARE TIME

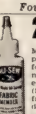
SENSATIONAL NEW LONGER-BURNING LIGHT BULB. Amazing Free Replacement Guarantee—never again buy light bulbs. No competition. Multi-million dollar market yours alone. Make small fortune even spare time. Incredibly quick sales. Free sales kit. MERLITE (Bulb Div.), 114 E. 32nd, Dept. C-153 New York 16, N.Y.

LAW FREE BOOK

THE LAW TRAINED MAN

Write today for a **FREE** copy of illustrated law book, "**THE LAW-TRAINED MAN,**" which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for FREE law training book today.

Blackstone School of Law, 387 N. Michigan Ave.
Founded 1890 **Dept. 55, Chicago 1, Illinois**



25¢ SAMPLE

$1.00 Value — Magic 60-Second FABRIC MENDER

Make up to $5-$10 an hour just daring men and women to pull apart shoe laces and other fabrics you mend instantly before their very eyes. Watch them grab this amazing liquid mender out of your hands for only $1. Big profits. No selling experience needed. We'll prove it by sending you sample ($1 value) for 25c to cover postage and handling. Also sells fast to stores in display carton. Exclusive territory plan for distributors. Other fast sellers. Facts FREE.

UNIQUE PRODUCTS 216 W. Jackson Blvd. Dept. 1435-N, Chicago, Ill. 60606

FOLDING KAYAK

The All-around Fun boat for all the family! Stable as a raft, fast as a canoe, inexpensive. Safe! Has unequaled stability due to its wide beam, great water displacement & low center of gravity. Sturdy: undamaged by beaching or scraping bottom. Will give years of pleasure. Size: 10 feet x 30" beam, folds compactly to 10 feet x 12" x 3" for easy carrying, transporting & storing. Sets up, ready to go, in seconds. Lightweight, only 35 pounds. Designed for capacity of 300 pounds, settles only 3" in water. Ideal for Fishing, Hunting, water fun. Easily assembled Kit also available, at great savings.

Write for full information —

KLONDIKE KAYAK, P.O. Box 63, Corte Madera, Calif.

DEATH ABSOLUTE CONTROL for HOME, FARM, INDUSTRY, RECREATION. Mosquitoes, Gnats, Moths, Millers, Boll Worm, Corn Borer, Oak & Lygus Moth, Heart Worm, Green Gnats, Tent Caterpillar, Wooley Worm, Pusa Caterpillar, Nor-Sect Insect, Etc. Money Back & Lifetime Guarantee - 10c Month to operate - Write

BLITZEN CORPORATION
Box 67 — Ferndale, Michigan — Zone 48220

BILL TROUBLES?

NOBODY REFUSED UP TO $9,000.00

BAD CREDIT • NO PROBLEM—NOT A LOAN CO.
SEND YOUR NAME FOR FREE APPLICATION
ATLANTIC ASSOCIATES—DEPT. 43
144 WESTMINSTER ST., PROVIDENCE 3, R. I.

SEPTIC TANK MAINTENANCE

ENZIVATOR is an enzyme product that STOPS ODORS—LIQUIFIES WASTE—ADDS BACTERIA—PREVENTS CLOGGING. It is Non-Poisonous, Non-Corrosive, Non-Caustic. Apply 1 lb. every 3 months. Available at Hardware Stores or order direct. 1 lb.—$2.95 ppd. Year's Supply, 4 lbs.—$10.95 ppd.

BOYER CHEMICAL COMPANY
Box #1279, Evanston, Illinois 60201

TO YOUR OWN DOCTOR'S PRESCRIPTION

EYEGLASSES BY MAIL AT GREAT SAVINGS!

Mail orders filled by licensed optician from **$9.95** (Including single vision lenses, frame and case).

Doctor's prescription will be filled by a skilled, approved and licensed optician or your own prescription duplicated. Lenses are ground and manufactured to U.S. optical standards. Choose from complete catalog of men's, women's and children's glasses. Bifocals, trifocals, sunglasses or SAFETY HARDENED LENSES at low additional cost. We guarantee accuracy, perfect fit.

SEND FOR YOUR FREE CATALOG TODAY

PRISM OPTICAL INC.

Dept. PM-4 136 Liberty St., New York 6, N. Y.

PROFIT IN YOUR SPARE TIME

SMALL ENGINE REPAIR PAYS BIG!

Outboard • Powermower • Chain Saw • Tractor

MAKE EXTRA MONEY — or fix your own engines and SAVE! Illustrated, easy-to-learn Home Study Course qualifies you as expert. Free information. Write today!

LINCOLN TECHNICAL INSTITUTE

SUITE 5E 472 MARKET STREET, NEWARK 5, N. J.

Hey Kids!

GAS ENGINES $5

Amazing directory tells where to buy Mini-bike frame $6, wheels $3, etc.!

RUSH 25c for brochure about directory to:

BARGAINS, PO BOX 4408, DEPT. PM5 CHICAGO, ILL. 60680

Arabs, breeders of fine horses for centuries, say the perfect specimen must have a neck curved like a crescent moon and a nose small enough to fit into a teacup.

NEW POULTRY

Pharaoh's Quail

Mature at 6 weeks. Lay an egg a day. For meat, eggs and hunting. For profit and pleasure. Small space needed. Send 50¢ for book, "Pharaoh's Quail". For $1, we include 2nd book, "The Quail Manual". Also quail price list.

MARSH POULTRY CO.
12252 Haga St.
Garden Grove, Calif. 92641

IF YOU HAVE HERNIA

Get this NEW FREE BOOK

Tells how Rupture can be treated by a mild Non-Surgical method that is backed by a Life Time Certificate of Assurance. This treatment method has a long history of use and is recognized by Authorities today. Men and Women from all over the country have taken the Non-Surgical Treatment and reported it is effective. Why put up with wearing a griping, chafing, unsanitary truss?

Write today for this FREE BOOK. Tells How, explains Why more and more Rupture Sufferers are using Modern Non-Surgical Treatment Methods. Act Now. No Obligation.

EXCELSIOR MEDICAL CLINIC

Dept. E6129 Excelsior Springs, Mo.

20 COURSE HOME STUDY PROGRAM

KARATE! JUDO

BOXING! MUSCLEBUILDING! YOGA! STRONGMAN STUNTS! STRENGTH & ENDURANCE! HANDBALANCING! ETC.

YOU GET **ALL** THESE COURSES! ★20 illustrated KARATE blows ★KARATE foot fighting ★Secret NERVE CENTER and ANATOMY charts ★20 lethal JUDO throws ★20 JUDO STRONG MAN STUNTS ★Complete MUSCLE BUILDING course ★Complete YOGA course ★HANDBALANCING stunts ★Complete BOXING course ★secrets of ENDURANCE ★WRESTLING holds ★WEIGHT LIFTING EXERCISES ★FLEX COURSE ★HEALTH & FITNESS EXERCISES ★KEEP FIT PROGRAM ★Human Anatomy Chart. No C.O.D.'s. Canadian 75c. YOU GET THE LOT.

ONLY **50¢**

Free K-Man Practice Dummy shows vital attack points.

COMPLETE HOME GYM PLANS—build gym equipment: vault horse, rowing machine, etc. Convert basement, garage to gym. ONLY 50c with courses. Total $1.00 complete.

OXFORD STUDIO, 146 Blake (PM-2) Hatfield, Mass.

NAME (print)

Address

City State

50c PROGRAM

$1.00 with GYM

Sure beats smoking!

Enjoy Copenhagen: Place a small pinch between cheek and gum. No chewing.

United States Tobacco Company

AUDEL GUIDES

No. 8	**Carpenters & Builders Guide. 4 Vols.** 1900 pages	$10.50
No. 1	**Auto Mechanics Guide.** 1132 pages	6.00
No. 15A	**Electric Library. 10 Vols.** 5558 pages	25.00
No. 2	**Home Appliance Service Guide.** 632 pages	6.95
No. 14	**Refrigeration & Air Conditioning Guide.** 1090 pages	6.00
No. 26	**Masons & Builders Guide. 4 Vols.** 1440 pages	10.50
No. 6	**Plumbers & Steamfitters Guide. 4 Vols.** 1833 pages	10.50
No. 3	**Radio–TV Library. 2 Vols.** 960 pages	9.50
No. 12	**Machinists & Toolmakers Handy Book.** 1256 pages	6.95
No. 10	**Welders Guide.** 606 pages	4.50
No. 49	**Outboard Motor & Boating Guide.** 414 pages	4.00
No. 4	**Handy Book of Practical Electricity.** 1052 pages	5.95
No. 25	**Blueprint Reading for Mechanics & Bldrs.** 430 pgs.	3.95
No. 27	**Electric Motor Guide.** 1036 pages	5.95
No. 11	**Mathematics & Calculations for Mechanics.** 672 pages	4.95
No. 53	**Foreign Auto Repair Manual.** 592 pages	5.00
No. 5	**Truck and Tractor Guide.** 908 pages	5.95
No. 7	**Painting & Decorating Manual.** 592 pages	4.95
No. 48	**Gas Engine Manual.** 468 pages	4.00
No. 28	**Oil Burner Guide.** 420 pages	3.95
No. 9	**Diesel Engine Manual.** 544 pages	6.00
No. 29	**Sheet Metal Pattern Layouts.** 1152 pages	7.50
No. 54	**Programmed Basic Electricity Course.** 272 pages	4.00

10 DAY FREE EXAMINATION. SEND NO MONEY. We'll send you any Audel Guides for FREE trial. If you decide to keep the books you pay only $3 per month under our easy-pay plan. Simply circle the books you want below and we'll send them at once. If you're not completely satisfied, return them to us.

THEODORE AUDEL & CO. - Since 1879 P-55
4300 W. 62nd St., Indianapolis, Indiana 46206

Please mail me for 10 days FREE EXAMINATION the books circled below. I agree to mail $3 on 10 days trial on each book not returned, and to mail $3 a month for each book or set, until I've paid the purchase price, plus shipping costs. If I'm not completely satisfied with my Audel Guides I may return them.

Name

Address

Employed by

1	2	3	4	5	6	7	8 9
10	11	12	14	15A	25	26	
27	28	29	48	49	53	54	

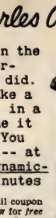
☐ SAVE SHIPPING COSTS. Check here if you enclose complete payment (plus sales tax, if any). We pay postage.

☐ I've bought Audel books before.

MAIL COUPON TODAY!

My name is Charles Atlas

I can't promise you'll win the title of "World's Most Perfectly Developed Man" as I did. But I do believe I can make a powerful He-Man of you -- in a very short time. I've done it for thousands of others. You can prove it to yourself -- at my risk. My secret of "Dynamic-Tension" does it in 15 minutes a day.



FREE BOOK Mail coupon now for *free* 32-page book. Tells how I can give you "Stand-Out" muscles — how *"Dynamic-Tension"* can make you a new man — confident, popular, successful. Rush coupon to me personally: **CHARLES ATLAS, Dept. 85, 115 East 23 St., New York, N. Y. 10010**

CHARLES ATLAS, Dept. 85,
115 East 23rd St., New York, N. Y . 10010
Dear Charles Atlas: Here's the Kind of Body I want.
(Check as many as you like)

- ☐ **Broader Chest, Shoulders**
- ☐ **More Powerful Arms, Grip**
- ☐ **Slimmer Waist, Hips**
- ☐ **More Solid Weight**
- ☐ **More Powerful Legs**

Send me absolutely **FREE** a copy of your famous book showing how *"Dynamic-Tension"* can make me a new man. 32 Pages, crammed with photographs, answers to vital questions, and valuable advice. No obligation.

Print Name..... Age.....
Address.....
City & State..... Zip Code.....
In England: Charles Atlas, Chitty St., London, W.1

WANTED! TRAINEES!

☐ At School ☐ At Home

Send for SAMPLE LESSON and FREE Aptitude Test today. Study at School or at Home. Earn while you LEARN. Accredited member National Home Study Council.

Get into one of these important fields:

- ☐ **MACHINIST TRADE**
- ☐ **TOOL-DIE MAKING**
- ☐ **DRAFTING**
- ☐ **TOOL DESIGNING**
- ☐ **INDUSTRIAL ENGINEERING**
- ☐ **AIR CONDITIONING REFRIGERATION**
- ☐ **AUTO MECHANICS**

Allied Institute of Technology, Dept. PM-55
1338 S. Michigan Ave., Chicago, Ill.

Please send me FREE information about the courses I have checked and Allied's Industrial Co-op Placement Service.

Name..... Age.....
Address.....
City..... County..... State.....

PROTECT YOURSELF! TEAR-GAS

TEAR GAS GUN OUTFIT
This all-steel, .22 cal. TEAR GAS gun shoots 6 times as fast as you can pull the trigger. Also fires blanks for alarm, or dog training, and flares for emergencies. Complete with 6 tear gas shells and instructions **$9.98**
BLUE STEEL **$9.98**
CHROME **11.98**
☐ Gun $9.98 ☐ Gun $11.98 ☐ Pen $4.98 ☐ Pen $9.98 ☐ Pen 2-Shot $11.98
☐ Holster $2 ☐ 30 Shells 6c, 99c ☐ 25 Shells 10-$1.50 ☐ Flares 6-$1.50 ☐ Blanks 100-$1.50

TEAR GAS PENS
This handy size chrome pen shoots the new powerful .38 spec. MAGNUM cartridge. Will halt an attacker – in his tracks, renders him helpless while you summon aid! Complete with 2 shells **$9.98**
As above, two shot with 2 shells **11.98**
.22 cal., single shot with 3 shells **4.98**

ORDER NOW! Mark Items You Want. Send Check or Money Order to:
TEAR GAS DEVICES CO. 136 Madison Ave., St. Louis, Mo. 63102
Pay-Paid in U. P. S. areas. Others: Express Collect (No C. O. D.)

B.S. DEGREE IN 36 MONTHS

Small professionally-oriented college. Four-quarter year permits completion of degree in *Engineering or Business Administration* in three years. One year Drafting and Design Certificate program. Founded 1884. Rich heritage. Excellent faculty. Small classes. Well-equipped labs. New library. Residence hall. 300-acre campus. Graduate placement outstanding. *Modest costs. Enter June, Sept., Jan., March. For Catalog and View Book, write Director of Admissions.*

TRI-STATE COLLEGE
455 College Avenue • Angola, Indiana

STOP FRONT DRIVE DRAG AND WEAR ON 4-WHEEL-DRIVES!

WARN HUBS Free-wheeling 2-wheel drive with Warn Hubs means big savings in gas, engine, tire wear, gas—plus more pep, performance, power in high, and easier steering. Rugged, dependable, proven, in billions of miles of use around the world. Choose Lock-O-Matic that changes drive as you shift, or manual Locking Hubs. Models for all 4-w. dr. at dealers, or write for literature.
WARN MFG. CO. Riverton Box 6064-A Seattle 88, Wash.

GUITARS *Big Discounts* WHOLESALER-TO-YOU!

BUY DIRECT! Famous Brands E-Z TERMS 5-Day FREE Trial

SAVE! BIG DISCOUNTS! Nationally advertised guitars. Over 100 models, all styles, for students and professionals. Low as $19.95! DIRECT from Wholesaler-to-You. Easy Terms, low as $5.00 down! **FREE** Home Study Course and Bonus Gifts! Discounts on banjos, mandolins, ukes. Satisfaction or money back. Free Color Catalogs, low discount prices. Write:
GUITAR WORLD, Dept. R-55
2003 W. Chicago Ave., Chicago 22, Illinois

ENROLL—EARN YOUR DEGREE

of Bachelor of Bible Philosophy (B.Ph.B.), Master of Bible Philosophy (M.Ph.B.), Graduate of Bible Philosophy (G.Ph.B.), Doctor of Metaphysics (Ms.D.), or Doctor of Divinity (D.D.); Chartered by State, correspondence Courses only. Please write for FREE BOOKLET.

AMERICAN BIBLE INSTITUTE
Dept. PM, 408A W. 75th St., Kansas City, Mo. 64114

BOAT OWNERS

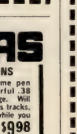
Modernize your boat with a VIKING REMOTE CONTROL AUTOMATIC ANCHOR. Convenient operation from any place on boat such as rear seat, keeps hands and boat dry and clean, no danger of falling overboard-SAFETY FIRST. Indispensable for outboards, sail, row and cruisers.

Up to 20 foot open boat $20. Up to 35 foot boat $35. Or send for circular.

SAFETY ANCHOR CO.
350 East Plaza, Solana Beach, Calif. 92075

AMAZING ILLUSORY **"X-RAY" VISION INSTANTLY!**

A Hilarious Laughingly Funny Illusion!



See through fingers—through skin—see gall of egg—see lead in pencil. Many, many, amazing, astounding, illusory X-ray views yours to see ALWAYS—when YOU wear Slimline X-ray Specs. Bring them, amuse friends. FUN-TUNE BANJO KIT—Tiny gives you a 3 dimensional X-ray illusion—the instant you put them on. No real X-ray vision is obtained. But you get an illusion of "X-ray" vision so real you will hardly believe your eyes. Full instructions of How To Enjoy Them To The Fullest! Last For Years—Harmless—Requires No Electricity Or Batteries—Comes Complete—Permanently Focused—Nothing Else To Buy—Send $1. plus 25c for postage and handling or send $2. for Deluxe model—money back if not 100% Satisfied.

SLIMLINE CO., Dept. 451
285 Market St., P. O. Box 90, Newark, New Jersey

'JOHN F. KENNEDY' 1964 P-MINT SET

2.95 10 SETS 27.50 postpaid

Send me _____ *sets at 2.95 each*
10 sets, 27.50

NAME _____
STREET _____
CITY _____
STATE _____

☐ CHECK ☐ M.O. ☐ C.O.D.

Now We Can Supply Them Again. Brilliant uncirculated Philadelphia coins, in a sparkling plastic lifetime holder. Perfect for collection, storage, display. The ideal set to hold for the future. *Unconditional Money Back Guarantee.*
Big State Coin Co. (Dept. T3) · 1416 Commerce St. · Dallas 1, Texas

---

"$7,108.50 First Year SERVICING RADIATORS!"
— Hank Konter, Newcastle, Wyo.

NEW!

Make good money servicing auto-truck-tractor radiators with new Inland 1-Piece Radiator Shop. Easy to test-clean-repair radiators. Inland, world's largest radiator equip. mfr., trains you free. Small down payment starts you. Easy-pay plan lets you pay from profits. Proved merchandising assures volume. Profitable deal for garage or service station. **WRITE for Free Book.**

INLAND MFG. CO., Dept. PM-5, 1108 Jackson, Omaha 2, Neb.

NEW CATALOG for CRAFTSMEN!

Workshop Supplies and Equipment, Kits, Power Tools, Special Hardware *All at Money Saving Prices*

WOOD..

Get our new 132-page FULL COLOR Catalog. Finest domestic and rare imported hardwoods. Legs, mouldings, ornaments, mosaic tile, lamp parts, glue injector, upholstery supplies. Over 1,500 items. New project ideas and plans. Discounts on Stanley Tools. Send 25c for postge., handling.

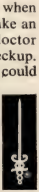
CRAFTSMAN Wood Service, Dept. A-5, 2729 S. Mary St., Chicago 8

---

8 out of 10 people have iatrophobia.* It is easy to overcome.

*Iatrophobia is fear of going to the doctor. The cure starts when you lift your phone and make an appointment with your doctor for a complete physical checkup.

Half the cases of cancer could be cured, if they were diagnosed early and treated promptly. Your best cancer insurance is a health check-up every year.



Make that phone call now. It might save your life.

AMERICAN CANCER SOCIETY

EARN $1,000 A MONTH

LEARN A TRADE YOU LIKE

Start as a mechanic in a good paying job; then advance to shop service manager. Many make $1,000 a month and up. You learn fast in our shop because you learn with tools on real equipment. Some students earn part of their expenses while going to school.

CHECK AND MAIL COUPON

☐ AUTO MECHANICS
☐ DIESEL MECHANICS
☐ GAS, ARC WELDING
☐ HELIARC WELDING
☐ AUTO BODY REPAIR
☐ AUTOMATIC TRANSMISSIONS
☐ MOTOR TUNE-UP

Mail to: AUTO-DIESEL COLLEGE
226 7th Ave., No., Dept. 86, Nashville, Tenn.

Please send without obligation free catalog

NAME _____
(please print or write plainly)
ADDRESS _____
CITY _____ STATE _____

CLASSIFIED ADVERTISEMENTS

Rate: $1.40 per word payable in advance each insertion. Minimum insertion ten words. To be inserted under the proper classification, copy must be in our office by the 15th of the second month preceding date of issue. **The next available issue to place an advertisement in America's No. 1 Classified Section is July. The closing date is May 15. Send remittance and order to C. A. Martin, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.**

POPULAR MECHANICS

AUTOMOBILES, MIDGET CARS

AUTOMOBILE Literature, antique thru modern; catalogs, photos, manuals. Monthly bulletin. Free information. Enthusiasts, Box 451B, Mt. Clemens, Mich. 48044.

CLUB Sweatshirts, $4.00. Most colors available. 50% Down. Jameline Products, 814 East Elizabeth, Ft. Collins, Colorado 80521.

AUTO SUPPLIES AND EQUIPMENT

JEEP Owners—V8 conversions. Read Jeep Owner, page 58A.

AUTO Welding repair training in world's largest non-profit welding school. Low tuition. Free booklet. Hobart Welding School, Box 30, Troy, Ohio.

MODEL A Ford parts. New illustrated catalogue 50c. Mark, Layton, New Jersey.

HIDDEN Switch foils the car thief. Duplicate key or jumping methods won't work. $3.00 complete. Details free. Nelson Security System, 34-PM Joliet Rd. Clarendon Hills, Ill. (Money-making opportunity for representatives and service stations.)

ANTIQUE Car pistons, gaskets, gears, valves, etc. Catalogue $1.00. Antique Auto Parts, Milwaukee, Wisconsin 53208.

NEW "Fury XII" capacitive discharge SCR ignition systems kit. Save to 50% by assembling it yourself! Satisfaction Guaranteed. $29.95 complete. Micro-Kits Co., Dept. PMC, Box 494, Paramount, California 90724.

FOREIGN Car parts. Discounts. Catalog. Box 7, Elmont, N.Y.

MICRO-Lube tuneup kit—2 cans for fuel, 1 for crankcase, $3.95, postpaid. Full instructions. Micro-Lube, Inc., 8505 Directors Row, Dallas, Texas.

NEW And used parts savings. Complete guaranteed service all model cars and trucks. Largest in west. Jeep and Army parts specialists. Shifting hube for all front-end drive vehicles. $27.50 up. Foreign parts. Fast service. Pioneer, 734 W. 13th Avenue, Denver, Colorado 80217.

AUTOMOTIVE Polyfoam toppers 15x15 x4" $1.99 ea. 26x54x2" $3.98 ea. Delivered U.S. check, M.O. Bermas Sales, 524 Smith St., Toledo 1, Ohio.

CROSLEY. New, used parts. Discounts. Catalog. Box 7, Elmont, N.Y.

SAVE $150! Ring-valve job while driving, $6.00 postpaid. Safe! Guaranteed! Many mechanics recommend. Molalay, Grantham, Penna. 17027.

AIR Compressor—Automatic, 150 lb. pressure, ½ HP, electric motor, 12½ gal. tank, complete with air chuck and hose. Uses: spray painting, inflating tires, blowing dust, operating air tools. $132.95 post paid. West of Mississippi. $142.95. Pennsylvania add 5% sales tax. Accessories: paint-spray gun, $12.50; regulator, $8.50; water tap, $6.95; blow gun, $2.40. Satisfaction guaranteed. No C.O.D. Reeco Products, Box 306, New Freedom, Pa. 17349.

IT'S Money in your pocket. Keep your motor running at top efficiency, use Fuel Activator for cleaner running, and Micro-Moly for better lubrication, gasoline or diesel. Money back guarantee. Send for particulars to Sennett "Says," P.O. Box 148, Garfield, N.J. 07026.

WHOLESALE To you, original tread not regroove 75 to 85% tread. Any small passenger tire, $3.52. Commercial tires, $9.02. Large truck tires, $20.22, 32 years at this address. Thousands of tires shipped all over the U.S.A. All tires shipped F.O.B. Phila. Highest used Standard Brand Tire Co., 834 N. Broad Street, Phila. 30, Pa.—No C.O.D.

JEEP Parts! For military and civilian. At great savings. Largest inventory. Catalog for owners and dealers. Inquiries invited. American Auto Parts Co., 1830-PM Locust, Kansas City, Mo.

TELL The more than 1,350,000 avid readers of Popular Mechanics about your products and services. It costs very little to place your classified message in front of these proven mail order buyers. For further details, write: C.A. Martin, Dept. 2, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

AUTO TRAILERS

PICKUP Campers—prefab—freight prepaid. Details free. Dealers wanted. Barnes, Grove, Oklahoma 74344.

BUILD Aluminum pickup camper overcab, hi-boy, lo-boy, bracket, material, list, 3 models included, $3.00. Bennett Custom Camper, 1104 W. Jefferson, Ft. Wayne, Indiana 46804.

BOAT Utility trailer plans, $1.00. State size. Parts kits, W. May, 12 Tompkins, Ossining, New York.

PICKUP Campers. Pre-cut kits. Blueprints. Supplies. Literature 10¢. Comstock Trailers, Parsons 4, Kansas.

PICKUP Camper, trailer or pickup-cover. Build yourself, save! Complete plans $3.95 each. Bus conversion (and house-boat interiors) Drawings $2.95. Equipment catalog, $1.00 (refundable). Satisfaction Guaranteed. Details free. Viking Camper Supply, 94-F Glenwood, Minneapolis, Minn. 55403.

CAMPER Units. Compact buses, vans. Build yourself. Plans, instructions, photographs. Set PM2 for Volkswagens, PM4 for Economy Dodges. $3.00 set. Dot Campers, Box 67, Saugus, California.

PRE-CUT Pickup camper kits. Ready to assemble. Free literature. Snowy Mountain Campers, PM, Lewistown, Montana.

TRAILERS: All kinds—boat, box or camping. Also: All parts to build your own. Send 25¢ for catalog. Norjack, 616 S. 108th St., Milwaukee, Wisc.

CAMPING Trailer kits, sleep 6. Basic Kit $148.00, 16' boat trailer kit $85.00. Utility trailers. Circulars 10¢ each. Stratford Trailers, Seymour St., Stratford, Conn.

MOTORCYCLES, BICYCLES, MOTORSCOOTERS AND SUPPLIES

BUILD Motorbike from Bicycle! Plans, $1.00. Go-Byk Industries, Rothsay, Minnesota 56579.

BE A BSA Motorcycle dealer! Some choice territories still open for ambitious men who want their own motorcycle business. Enjoy your favourite hobby, be independent in a business that gives you the financial rewards of your work and selling ability. Nominal investment required. (Other popular makes where we do not now have a dealer.) Write: BSA Incorporated, Dept. PM, 639 Passaic Ave., Nutley, N.J.

KART $7. Minibike $6, less engines. Engines $3.50 up. Cushman Eagle $40. Minibike $20, Kart $25. Tractor $10, with engines. (Mail order only). Send 25¢ (35¢ for First Class Mailing) for Directory-Catalogue Number 123 listing these and hundreds of other bargains, homebuilders parts, plans, etc. Midget Motors Directory, Athens, Ohio.

HARLEY-Davidsons — Used bargains. New, used parts, accessories, all models. Bulletin 25¢. Knuth's (Factory Dealer), 1752 Mitchell, Milwaukee, Wis.

RECONDITIONED Motorcycle motors. Large stock Indian Cushman Vespa Mustang NSU. Parts. Hinds Motorcycle Sales, Kansas City, Missouri. 64127.

STOP Those dogs! One squirt of safe, tested "Halt!" dog repellent stops dogs in their tracks. Small squirt-can fits pocket. $1.98 at cycle shops, or Golden Crown, 4519 Marquette, Jacksonville, Florida 32210.

GO-CARTS, Hydro-karts, engines. Wholesale catalog, 25¢. Loran Products, Danville, Illinois.

MOTORSCOOTER And motorcycle parts new-used for all makes, models. Big savings. Sam's RT-10, Box 131, San Antonio, Texas.

AVIATION

BE A Government licensed aviation mechanic. Practical training. Free information. Aero Mechanics School, Municipal Airport, Kansas City 16, Missouri.

AIRBOAT-Snowplane propellers, plans, kits, supplies. World's lowest prices on sauges, throttles, spark plugs, gas-oil hose, oil coolers, primers, tachometers, hubs, engine mounts, conversion parts, fittings, 125 H.P. Corvair engines, rockets, parts. Catalog 25¢. Banks-Maxwell, Box 3301E, Wichita, Kansas 76105.

JET Engines for sale: also plans and kits. Brochure or information, 25¢ handling. Jetair, Box 73, Jasonville, Indiana.

GYROCOPTER Blades, kits, parts, plans; Vancraft, 7245 Mohawk, Portland, Oregon 97202.

HOMEBUILT. Reni enclosed helicopter, 24 pages ideas, information, $2.00. Build "executive" helicopter, drawings, specifications, $1.50. Helicopter Development, Box PM147, Washington, New Jersey.

AVIATION Space books free. 48-page catalog. Aero Publishers, 329 Aviation Road (PM), Fallbrook, Calif. 92028.

HELICOPTER Demonstration film shows principles of operation. 8mm, $9.95. Box 2701, Culver City, Calif.

BATTERIES, GENERATORS

COMPLETE Rebuilding Manuals! Batteries $3.00. Hydraulic Jacks $3.00. C.O.D. accepted. Bayer Publications, 938 Betty Avenue, Neenah, Wisconsin.

BATTERY Reconditioning kit, includes molds, material, complete instructions. Battery Shop, 18182 Vierra, Salinas, California.

ELECTRICAL SUPPLIES

METERS—Surplus, new, used, panel and portable. Send for list. Hanchett, Box 1898, Riverside, Calif.

LAMP Parts. Catalog, prices, wiring instructions 50c. Refunded first order. Gyro, 5208P N. 35 Ave., Phoenix, Ariz. 85.

APPLIANCE Lamp parts. Wholesale catalogue. 25c. Seco, 112 South 20th Street, Birmingham, Alabama 35233.

ARMATURES Rewound! Your electric vacuum cleaner, mixer, drill, saw, etc. A.C. or D.C. armatures rewound at lowest prices. Deal direct and save! Send for free price list. Armature Sales, Inc., 24956 Sherwood, Centerline, Michigan.

WELDING, SOLDERING, PLATING

CHROME Plating equipment, supplies. All other finishes. Home workshop and production sizes. Send $1.00 (refundable) for formulas, operating data, equipment guide and catalog. HBS Equipment Division Lab, 146 Avalon Pacific Avenue, Los Angeles 23, Calif.

A.C. WELDERS. Oil protected. $49.50. Morris, 1070 Inner, Schenectady, New York 12303.

FREE: Make money, have fun with cheap welder. 25 Cent coin for handling. Aqua Jets Company, Florence, Kentucky.

NEW Soldering iron. One hand operation. Automatic feeding. Free details. Jeret, Box 1357, Sarasota, Florida.

ACETYLENE Welding outfits new $69.50; used $50.00; Arcwelders $69.50. Eagle Welding, Dept. PM, 5658 Broadway, Chicago, Illinois 60640.

FREE Catalog. Welders, kits. Build 400-ampere aircraft generator welder. Plans 35c. Dunbar, Chaska 17, Minnesota.

MACHINERY, TOOLS, SUPPLIES

3 H.P. HOEING machine. Hoes between plants, rows. Depth adjustable. Self-propelled for tired tiller wrestlers. Month trial. Year warranty. Discount. Autohoe, West DePere 22, Wisconsin.

SMALL Shop supplies. Production—hobby. Campbell Tools, 1424 Barclay, Springfield, Ohio.

SEND For free 28 page pocket size illustrated catalog on angle vises, drill press vises, milling attachments, and rotary tables. No shop complete without these tools. Palmgren Steel Products, 3365 South Chicago Avenue, Chicago, Illinois 60617.

TOOLMAKERS, Machinists—now hear this: Revolutionary simple device greatly facilitates precision grinding, measuring die sections, punches. Tremendous saver of time, nerves. Indispensible for every Tool and Die craftsman. Also ingenious, inexpensive depth micrometer attachment permitting outside measurements up to 8 inches. Free particulars, illustrations. CHR Manufacturing, 1015 Wichita Plaza, Wichita, Kansas, 67202.

MAKE Your bench pipe-vise a tri pod 3 legged type, cheap. Box 496, 531 East 180th Street, New York, New York 10457.

MACHINISTS, Toolmakers chests. Circular free. Cepuder, 4715 Spencer, Lisle, Ill.

DIE Set bends metal using press brake principle. Magnetically attaches to any vice. Female die can also be used for V-Block. Guaranteed. $2.00 postpaid. Craftmaster Tools, Box 73, Lancaster, N.Y.

METALS—Aluminum, brass, stainless. Drills, files. Free catalog. Americraft, Box 5, Mohawk, New York.

BEARINGS. Complete selection, save. Cone Bearings, 1715 Speer, Denver, Colorado 80204.

JUMBO Assortments of job lot sharpening stones. Bargain packages of eight, four inches long, $1.00 or twelve, six inches long, $3.00 postpaid. 50 states. J. Reinhert Company, Maywood, Illinois.

STANLEY, Millers Falls, Skil, Disston, Wiss, Plumb, Channellock, Bonney, Herbrand, Ridgid, and hundreds of other nationally advertised brands at prices hard to beat. Send 25c for our big tool catalog today! Silva Hardware, 107PM Walnut, Phila. 6, Penna.

ENGINES, MOTORS, DYNAMOS

WINDING Data. 275 motors, single and three phase $3.10. Data Company, 513 Kensington, Kansas City 24, Mo.

REWIND Electric motors! Details free! Modern, Box 10025, Kansas City, Mo. 64111.

FAGEOL Aerojet, Crosley, Crofton, genuine engine parts, direct to you. Crofton Company, San Diego, Calif. Complete VIP marine engine, only $333.00.

USE 3-phase motors on single phase. No ballasts, condensers. Rewiring. Send $2.50 for technical knowhow. Strane Electric, Box 555, Hawthorne, Calif.

REWIND Motors yourself. Complete instructions. $1.00. Lewis Manufacturing, Howell, Michigan.

GOVERNMENT SURPLUS

GOV'T. Surplus. How and where to buy in your area. Send $1.00. Surplus Information Headquarters Building, P.M., Washington 6, D.C.

JEEPS low as $62.50—Autos—Boats—Thousands Others, "As is" Direct from Government. Complete Guide to Buy your State and 1965 Directory" send $1.00. Surplus Disposal, 2230-PE Wisconsin, Washington, D.C. 20007.

FACTS Concerning Government surplus, (stamped envelope required), 2-770(B), Box 8000, New Jersey.

JEEPS $64.50 . . . Boats $6.18 . . . Typewriters $4.15 . . . Airplanes, Sporting Equipment, 100,000 Bargains typically like these "as is" direct from government in your area. For complete directory and surplus catalog Send $1.00. Surplus Service, Box 820-A, Holland, Michigan.

JEEPS $53.90, cars $31.60, trucks $78.40; many others direct from Government. Used "Directory" and our "new" 450 item (order by mail) 1965 surplus catalog. Send $1.00 (deductible on first $10.00 order). Quality Surplus, Box 22038 (PM-5), Indianapolis, Indiana.

JEEPS $53.90, cars $31.60, trucks $78.40; many others direct from Government. Used "Directory" and our "new" 450 item (order by mail) 1965 surplus catalog. Send $1.00 (deductible on first $10.00 order). Quality Surplus, Box 8 (PM-5) Washington Building, Washington, D.C.

GOVERNMENT Surplus. Complete sales directory $1.00. Surplus Publications, Box 45781, Los Angeles 45, California.

SURPLUS. Fantastic low prices. New information, $1.00. Surplus, Box 807, Clarksville, Tennessee.

FREE! You can get hundreds of big illustrated government surplus catalogues absolutely free! For full information send two thin dimes today to: Surplus, Box 177-PM, Abbottstown, Pa.

JEEPS, $62.50; typewriters, $4.15; boats, $6.18; guns, walkie-talkies, binoculars. Typical surplus prices! Send Exciting details free. Enterprises, Box 402-X15, Jamaica, New York 11430.

BOATS, OUTBOARD MOTORS

BUILD Your own boat from our large scale blueprint books of plans giving how-to-build help. Hundreds of professional designs—motor, sail or auxiliary—for amateur builders. Free catalog. MoToR Boating, 959 Eighth Ave., Dept. R5, New York 19, N. Y.

BOAT Kits! Factory molded fiberglass or pre-assembled plywood. 50 models, 12' to 30'. Free catalog. Luger, Dept. BC-65, 9200 Access Road, Minneapolis 31, Minn.

BOAT Plans, frame kits, full size patterns all prepared specially for amateurs. Send 50c for new catalog illustrating 55 proven designs including sail, inboards and outboards from 7' to 28'. Glen Designs, 9152 Rosecrans, Bellflower, Calif.

KAYAKS—One-man $16.50; two-man $22.50; sail attachment $16.50. Exciting Sitka kayaks. Sold the world wide for speed and safety. Assembled in one afternoon. Free pictorial literature. Box 78-P, Brecksville 41, Ohio.

INBOARD Engine kits for Chev., Pont., Buick, Ford, etc.—Free catalog. Star Marine, Berkeley 10, Calif.

FULL Size, cut-to-shape boat patterns, blueprints, 7½-38 feet. Big new illustrated catalog $1.00. Catalog of 64 designs, including catamarans, cruisers, runabouts, skiffs, outboard boats, sailing, racing, houseboats, 50c. "How to Build a Boat" booklet, $2.50. Cleveland Boat Blueprint Co., Box 18250, Cleveland, Ohio.

BOAT Bailer for small craft. Completely automatic. A check ball does it; and it won't forget! Only $4.95. More info. Write: DePersia Automatic Bailer, Inc., Dept. PM, Grand Haven, Michigan 49417.

FIBERGLASS Canoes. Three exciting models. Ready assembled kits $29.95 up (factory direct). Free literature. Riverside Canoes, 5811D Victoria Ave., Riverside, California.

BUILD Your fiberglass boat! New illustrated specification of simplified mold making and molding technique. $5.00. Custom Craft Engineering, Thompson, Manitoba, Canada.

30 H.P. Outboard motors or powerheads. Brand new 1963's $185.00. Write: Motors, P.O. Box 111, Perry, New York.

NEW, Used, rebuilt marine motors. Marine engine fittings. Free catalog. Stokes Marine Supply, Dept. 24, Coldwater, Michigan.

SPEED—8 Ways to make your outboard rig faster, $1.00. P.O. Box 387, Colton, Calif.

FIBERGLASS Boat covering. Wholesale prices. Free literature and sample. Seifert's, Box 1206-M, Green Bay, Wisconsin.

FIBERGLASS Cloth and resin. World's finest cloth and non-run resin, at direct mill prices. Floatation foam. Complete line of plastics, silicon bronze and brass screws, save 60%. No sales tax. Free catalogue. Freight prepaid. Stiles Boat Supply, Box 11P, Linden Ave., Mantua Hts., N.J.

KAYAK, Canoe plans. Illustrated catalogue 10c. Bruce Clark, PM, 115 McGavock Pike, Nashville, Tenn. 37214.

SKIMMER Hydrokart 8 ft. outbard, plans and patterns, $7.00; illustration and materials list, 10¢. Hydro Products, 5981 Kay Dr., Fairfield, Ohio 45014.

AMAZING Boat floats 5,500 lbs.—construct 8 hrs., free plans. "Build Poor Man's Yacht, $100.00. Send $3.00. Universal Products, P.O. Box 6115 Sta. B, Evansville, Indiana 47712.

MARINE Conversions, Ford, Chevrolet, Jeep engines. Catalog 25¢. Lehman Manufacturing Company, 800 Elizabeth Avenue, Linden 4, N. J.

SPORTING GOODS, GUNS, FISHING, SKIN DIVING, ARCHERY

FANTASTIC Device that guarantees to improve your fishing catch. Free details. TR Enterprises, Box 472-A, Brooklyn, N.Y. 11202.

KNIVES! 35 Exciting models. Fishing, hunting, camping. Grand 'H' Specialties, Boston 14, Mass.

GOVERNMENT Surplus Bargains, in guns, ammunition, edged weapons, hunting, camping, fishing items. Write for giant free catalog. P & S Sales, Box 155, Tulsa, Oklahoma.

LITTLE Mike baseball pitching machine endless hours of valuable batting practice for little leagues and big leagues. Only $119.50. see your local dealer or write to: Zone Mfg. Co., 3957 Park St. Louis, Mo.

MOLDS For fisherman's sinkers, jigs, squids, casting and spinning lures. Free catalog. Sweet's Molds, Tonawanda 1, New York.

BIG Money raising crickets and 12 inch African fishworms. Free literature. Carter Ranch, Pelham, Georgia.

FISHING Tackle buys 6 wooly worm flies, $2.70 value only $2.10. Many more. Satisfaction guaranteed. Western, Box 296, Dept. D-5, Woodland Park, Colorado.

WHOLESALERS Wanted for the new Trisonic fish aid. 40 Million fishermen the market. Make $200.00 a day selling the battery operated seven frequency ultrasonic wave device. Send $10.00 for sales kit including sample with batteries. Freeman, 15 Riverside Court, Monroe, Mich. 48161.

SILENCERS: Rifle pistol. Details construction operation, $1.00. Cunsco, Soquel, Calif.

E-Z Troller at factory introductory price. Permits trolling all day at "fish catching slowness," even with cruising motors, without motor trouble, vibration or weeding fouling. Fits all outboards. Installed in moments. Satisfaction guaranteed, $5.95 postpaid. G & P Sales, D-5 Box 7054, St. Louis '77, Mo.

TRANSISTORIZED—Fish call, $10.95. Write: Gels, Box 64, Eau Claire, Wis.

GOLFERS—Like seeing a pro in your mirror. Improve your swing through this amazing discovery. Send $1.00. Golf, P.O. Box 256, Coney Island Station, Brooklyn, N.Y. 11224.

100 AMAZING Lures, $2.00. Mirrorized Mylar minnows attract and produce live bait. Introductory assortment—colors, shapes, sizes. TW Products, 6309C Cedar, Uniondale, New York.

FISHING Secrets: catch thousands, unpublished, free electronic fish call, sport and commercial. Write: Universal Products, P.O. Box 6115 Sta. B., Evansville, Indiana 47712.

JUDO, Karate supplies, accessories, 20 page catalog 15¢. Nozawa Trading, 232 East Second Street, Los Angeles 12, Calif.

FREE . . . Wholesale catalog. Beads. Spinners. Lure parts. Sinker molds. Jigs. Reels. Finnysports (ME). Toledo, Ohio 43614.

YOUR Ad in this space will be read by more than 1,350,000 active mail order buyers. Join the march to greater profits, place your classified services in front of them today with a small low cost classified ad. For further details, write C. A. Martin, Dept. 13, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

ATHLETIC EQUIPMENT BODY BUILDING COURSES

BARBELLS, Exercise equipment. Key to health, strength, physique. 25¢. Reading Barbell Co., West Reading, Pa.

"GIANT Arms." Dr. Young's, D.C. revolutionary discovery. $2. Satisfaction or refund. Gaucho, Box 9309-87, Chicago 90.

CAMPING EQUIPMENT AND TENTS

GIGANTIC 1965 Catalog, 132 pages of tremendous values & variety of sleeping bags, imported & American tents, camping accessories, clothing and government surplus. Send 25¢ for catalog and save on all your needs. I. Goldberg, Dept. PMC, 429 Market Street, Philadelphia, Pa. 19106.

CAMPING Equipment, unusual selection. Morsan's own quality tents (200 styles) timer fabrics; sleeping bags (80 styles); every camping convenience imaginable. Free giant catalogue-buyer's handbook. Morsan, 810-R Route 17, Paramus, New Jersey.

BINOCULARS, TELESCOPES, MICROSCOPES, MAGNIFIERS

SCIENCE Bargains! Lenses, telescopes, binoculars, microscopes, kits, parts, war surplus. Send $1.00 for beginner's 10-lens unit with instruction booklet. Order Stock 2-CH. Request free 148 page Catalog CH. Edmund Scientific Co., Barrington, New Jersey.

DYNASCOPE—Amazing world famous reflector telescope. Request free brochure. Criterion, Dept. DP-20, Hartford, Connecticut.

BINOCULAR Sale! Free Color Catalog 90 models $9.95-$250.00. Write United, 9041 So. Western, BCAT 5208, Chicago, Ill. 60620.

BUILD Your own reflector telescopes; Complete kits; Mirrors, eyepieces, tripods. All other accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KFM-36, Hartford, Connecticut.

PLANTS, NURSERY SUPPLIES

WANT Greatest cash crop working for you? Write Ginseng, Asheville 53, N. C.

GINSENG Bringing $14 pound. Have seeds, plants. Goldenseal. Full information. K. Collins, Viola, Iowa 52350.

EARTHWORMS, CRICKETS, FROGS

FROG Raising. Young frogs and giant breeders. Stock your lakes, pond. Nu-Tex Frog Farm, Box 4029, Corpus Christi, Texas.

EARN Money raising fishworms for us! Exciting details free! Oakhaven—56, Cedar Hill, Texas.

HYBRID Redworms, 1,000—$3.00, 2,000—$5.00, 5,000—$8.00, 10,000—$14.00. Bedrung 20,000—$20.00. Postpaid with raising instructions. Brazos Bait Farms, Route 9, Waco, Tex.

GEORGIA Redworms. 2500 $4.95. Postpaid promptly. Free literature. Hall's, Hilton, Georgia 31758.

FREE Literature. Big money raising African Nightcrawlers. Redworms. Three Oaks Ranch, Dresden, Tennessee.

MEN! Women! Make money raising bait for us at home. Red Wigglers. Warsaw 45, Indiana.

AFRICAN Nightcrawlers! 500—$7.00. 1,000—$12.50 postpaid! Dealers Wanted. Ozark Worm Farm-J, Willow Springs, Missouri.

SUCCESS For you! Raise fishworms and crickets. Write for free literature and our success story in Life Magazine. Let us teach you our secrets of success. Hybrid redworms 3000. $5.95. Carter Redworms, Plains, Georgia.

FARMS, FARM LANDS, REAL ESTATE

CANADIAN Vacation lands: Full price $385.00. 40 acres. $10 month. Suitable cottage sites, hunting, fishing, investment. Free information. Lands Department, C-P Bathurst, Downsview, Ontario, Canada.

CAROLINA Coast. ½ acre homesites as low as $435.00. $5.00 down, with 10 year, money back guarantee and free life insurance. in a 16,000 acre Paradise in the Pines. 50 fresh-water lakes. 4,000 acre game preserve, golf course, country club, shopping center, motel, already built. Only minutes to private ocean beach. For free map and details write Sailing Lakes, Southport 1-E, North Carolina 28461.

CANADIAN Lands, seized and sold for taxes. Our 48th annual series of lists, describe many choice properties, situated from coast to coast, acquired by us through tax sale. Priced as low as five dollars per acre, many suitable for farming, some monthly payments, no mortgage. Beautifully situated hunting and fishing camps, where there is real sport; summer cottage sites, heavily wooded acreage. Now is the time to invest in Canada's minerals, forests and farms. Write to-day for free twenty page booklet which explains these. Tax Sale Service, Room 301-D, 85 Bloor St. E., Toronto 5, Canada.

400,000,000 ACRES Government public land in 25 states. Some low as $1.00 acre. 1965 reports. Send $1.00 National Land, 422PM5, Washington Building, Washington, D. C.

$5 MONTHLY Buys 5 acres. Near town, good building site, excellent fishing. Price $125.00. Free list. Box 425-P Carthage, Missouri.

TIMBERED! Agricultural land, $15.00 acre. Mineral area. Complete details. Explain wants. Address; Ozarks, Shook, Mo.

FLORIDA Campsites—deep in the heart of the great Ocala National Forest. Good hunting and fishing. Free maps and photos. Gerald Verner, DeLand, Florida. AD646369D

GOVERNMENT Land available in 25 states. Some low as $1.00 acre. Millions of acres! Facinating copyrighted report and "Land Opportunity Digest," send $1.00. Land Disposal, 2330-PE Wisconsin, Washington, D.C. 20007.

FLORIDA Water Wonderland—Homesites, cottage-homes, mobile-home, campsites. Established area. $390 full price, $5.00 month. Swimming fishing, boating, hunting. Write Lake Weir, Box 388K, Silver Springs, Florida. Ad 6-1070-(F-1).

$1 ACRE—Canadian border—hundreds campsites, islands, farmlands, directly from tax authorities. (Non-profit). Lists, photographs mailed. Register, Box 203, 92 King St., E., Toronto 1, Canada.

MILLIONS Of acres government land. Some low as $1.00 acre. 1965 report send $1.00. Land, Box 22127K5, Indianapolis, Indiana.

FREE! New illustrated summer catalog. Top values coast to coast! Farms, ranches, homes, businesses, waterfront, recreation, retirement properties. United Farm Agency, 612-PM West 47th St., Kansas City, Mo. 64112. PLaza 3-4212.

CALIFORNIA—Real estate & business relocation specialists. Offices—Los Angeles & San Francisco Bay areas. Write: Tibbals' Realty, 3109 West Beverly, Montebello, Calif.

STROUT Spring catalog, free nationwide issue of top values in 34 states. Hundreds pictured. Farms, ranches, homes, businesses, resorts, models, recreation and retirement properties. Strout Realty, 7-CJ S. Dearborn, Chicago, Ill.

ABANDONED Timber Leaselands! Choice 640 acre Sportsmen's paradises still available—$20.00 plus $6.50 for yearly. Map, picture, $1.00 (Refundable). Director, Erindale 4, Ontario, Canada.

PETS—DOGS, BIRDS, HAMSTERS, ETC.

RAREST Ornamentals. 48 page catalog 35¢. Everything, you name it. 175 picture hobby brochure 25¢. Stromberg's Pets Unlimited, Fort Dodge 25, Iowa.

PETS. Hamsters, mice, rabbits, squirrels, chipmunks, guinea pigs, skunks, raccoons. Picture catalog twenty-five cents. Moore's Hamster Ranch, Shepherdstown 25, West Virginia.

HAWKS. Reptiles, raccoons, skunks, squirrels. Catalogue 25¢. Trails End Zoo, St. Stephen, S.C.

MAKE Money raising chinchillas, mink, rabbits, cavies for us. Free catalog. Keeney Brothers, New Freedom 2, Penna.

RABBITS—FUR BEARING ANIMALS

RAISE Rabbits successfully by knowing facts. 48 page illustrated book describing 25 breeds. Housing, breeding, feeding, markets, marketing etc. 25 cents. American Rabbit Association, 36 Arba Building, Pittsburgh, Penn.

BOOKS 50¢ each: Rabbits, Chinchillas, Guinea Pigs, Hamsters, Chipmunks. 175 picture brochure 25¢. Stromberg's Pets Unlimited, Fort Dodge 25, Iowa.

MINK Raising information free. Lake Superior Mink Farm, Inc., Superior 661, Wisconsin.

EARN $10,000 yearly raising Angora rabbit wool, and breeding stock we pay $7.50 for breeding Stock and $3.50 per pound for wool. Unlimited market. Free information. United Angora, Box 154, Turner Branch, Kansas City, Kansas.

RAISE Rabbits on $500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

EARN $10,000 Yearly raising Angora rabbit wool for us. Information 25¢ coin. American Angora Company, Malta 12, Montana.

BOOKS, PERIODICALS, PICTURES, POSTCARDS

FREE Catalog. Self-help books. Write Wilshire, 8721 Sunset, Los Angeles 69P.

SAVE To 84% on books. Free Catalogue Discount Reader's Service, M-5435 Upland Way, Philadelphia 19131.

BOOKS Located free. Large stock all subjects. Send wants. Mrs. P. Myers, Orient, Illinois 62874.

FREE Book catalogue. Wolfe, P.O. Box 6625, Phila., Penna. 19149.

PROPHET Elijah coming before Christ. Wonderful book free. E. Meriddo Mission, Rochester 19, New York.

40 PAPERBACKS $5. Exchanged one for two. Books!. North Adams, Mass. 01248.

BOOKFINDERS! All subjects. Send wants! Sydney Jaher, 175-45 88 Ave., Jamaica, N.Y. 11432.

THINKERS, Intellectual, science books, free catalog. Superior Books, Box 2832, San Diego, California 92112.

TERRIFIC Book bargains! Free catalog. Marich, 3452 Mass., Gary, Indiana 46409.

BOOKS, Periodicals, Foreign, domestic. Illustrated catalogs, free. Global Books, Grand Central, Box 1632-PM, New York, N.Y. 10017.

FREE Catalog of unusual books. Thousands of titles. G & A Books, Inc. Dept. B, 251 W. 42 St., New York City 10036.

PUBLISH Your book! Write for free "Truth about Book Publishing." All subjects invited. Elysion Books, 6715-PM Hollywood Blvd., Los Angeles.

PUBLISH Your book! Join our successful authors. All subjects invited. Send for free appraisal and detailed booklet. Carlton Press, Dept. PMQ, 84 Fifth Avenue, New York 10011.

BOOKS, Free general catalog, 100 pages. Text, vocational, educational, instructional subjects. Millions of volumes, new and used. Bargain prices. Books bought. Est. 1902. Long's College Book Co., Dept. PM, Columbus 1, Ohio.

MAGIC TRICKS, PUZZLES, JOKER NOVELTIES

NEW Edition, 1965 catalog, 500 tricks, only 10¢. Fastest same-day service to magicians for 40 years. Send 10¢ today. Douglas Magicland, Dept. 21, Dallas, Tex.

MAGIC Catalog! World's finest. 3000 tricks (408 pages) $2.50. Beginners amateurs, professionals. Kanter's, A-200 South 13th St., Philadelphia, Pa. 19107.

COMPLETELY Illustrated catalog, 84 pages, 25¢. Manhattan Magic, Box 334-M, N.Y.C. 11.

LATEST Giant surprise catalog! 1000 Professional tricks, novelties, jokes! Exciting! Thrilling! Only 10¢. Vick Lawston's Magic, Dept. PM65, 4018 N.E. Fifth Ave., Ft. Lauderdale, Florida.

WORLD'S Finest professional magic tricks. Joker's novelties. Giant illustrated catalog 10¢. Top Hat, Evanston, Illinois.

VENTRILOQUISM! Information Free! Dummy Catalog 25¢. State age. Maher, Box PM-5, Kensington Station, Detroit 24, Michigan.

BE A Magician! Introductory catalog with free trick, only 35¢. Ireland Magic, 5082 Lincoln, Chicago, Illinois 60625.

VENTRILOQUISM For fun or money. New method. Easy. Also professional dummies. R. Marlow, 1570 Glen Ellyn Rd., Glen Ellyn, Illinois.

LEARN Ventriloquism, illustrated course by professional teacher makes it easy. Send for brochure. P. Stadelman, 1449 Fargo, Chicago, Ill.

FUN 'N Magic catalog, 10¢. 1,500,000 tricks, jokes, novelties, puzzles, disguises, books. Elbee 7408-P, San Antonio, Texas 78207.

PROFESSIONAL Catalog. 175 pages, 25¢. Williams, 900 Plymouth, Ellwood City, Penna.

GAMES, TOYS, NOVELTIES

WHOLESALE—Tricks, jokes, funmakers. Sell friends. Big catalog 50 gag samples 25¢. Dunn-7C-Marks, Broadview, Illinois.

SENSATIONAL Toy derringer shoots rubber bands twenty feet. Safe, fun, accurate! Two pistols, five packs ammo, $1.00 minimum. Aredon, 1170 Sacramento St., San Francisco, Calif.

STAMP COLLECTING

60 DIFFERENT U.S. (30 commemoratives) 25¢. No approvals. Seidenberg, Salem 169, Oregon.

AMAZING OFFER! 200 United States stamps—including commemoratives, airmails, high denominations to $1.00. Only 10¢ to approval applicants! Illustrated bargain lists free. Mystic Stamp Co., Dept. 80, Camden, New York.

FREE Monaco nudes. Approvals. Stamp Ranch, 902 Addison, Chicago 13, Ill.

U. S. approvals. Low prices. Eagle Stamps, Romine Ave., Pittsburgh 26, Penna.

INTRODUCING Our better United States approvals we offer 15 United States stamps including Columbian, Bi-Centennials, famous American, airs, others: only 10¢. Ocean Stamps, Box 64-PM, Brooklyn 29, New York.

UNITED States commemorative collection containing 33 different—10¢. Approvals. White, 516-A Avenue L, Brooklyn 30, New York.

UNITED STATES price list, 132 pages, price 30¢. Mark Hanna, 335 Fifth Ave., Pittsburgh 22, Pa.

U.S. Mint specials! Flag set, complete $1.00. 1¢, 2¢, 3¢ famous Americans (21 different) $1.00. Free list. Brooks, 2601 Avenue "U", Brooklyn 29, N.Y.

THOUSANDS Of worldwide sets and singles on approval. Highest quality! Cole, Box 2224, Buffalo, N.Y. 14221.

U.S. Bargain, 50 different 10¢, with beautiful worldwide approvals. Stamps, Kennebunk, Maine.

GERMAN Commemoratives. 10¢ with approvals. Schaefer, Box 1704, Washington 13, D.C.

FREE Stamp wallet with approvals. Wide selection collections by countries. Clark, Box 28-C, Wilmette, Illinois.

KENNEDY Memorial set. Mint. Colombian multicolored air mail. Shows late President. Free! With approvals. Philatelics, 78-S, New Paltz, N.Y. 12561.

49,000 DIFFERENT. Amazing new plan builds your collection systematically, country by country. As low as 50¢ weekly. Ware, Monroe 75, Conn.

MILLION Foreign stamps! 2¢ each! Send for thrilling, giant approvals! ABC Stamps, Box 6000-MB, San Francisco 1, Calif.

FREE Surprise collection sent with approvals. Gould, 1784 Union, San Francisco 94123.

1500 FOREIGN $1.00. 5000 $3.00. 5000 USA—commemoratives, airs, high values, revenues, 19th Century, etc. $3.00. No approvals. Meyers, 5321 Fleming, Richmond, California.

20 DIFFERENT United States Commemoratives 1893 up 10¢. Approvals. K&B Stamp Company, Box 70, Brooklyn 23, New York.

105 DIFFERENT U.S. Stamps, 25¢, approvals included. Shelron, Box 187, Hempstead, N.Y.

BREATHTAKING, 50 Mint Monaco pictorials, multicolors $1.00. Approvals. Stamp Exchange, Box 103, Fairfield, California.

FREE! Giant Bargain Catalog—New Edition listing thousands of bargains including U.S. and B.N.A. stamps, packets, mixtures, albums, accessories and supplies; sent with beautiful approvals. Jamestown Stamp, Dept. E-55PM, Jamestown, N.Y.

WOW! 110 All Different Germany 10¢! Zeppelins, Semi-Postals, Airmails, High values, etc. Giant Catalog, bargain lists included with beautiful approvals. Jamestown Stamp, Dept. A-55PM, Jamestown, N.Y.

50 YEARS Old, fifteen different United States, over fifty years old—10¢ with approvals. Jaxon, Box 145-P, Brooklyn, New York 11230.

PENNY Foreign stamps neatly mounted in jumbo books in Scott order. Bullot Approval, 1454 Coney Is. Ave., Brooklyn 30, New York.

"INVERTED Error," Dag Hammarskjold 5¢ with Approvals. Belmont Stamps, Washington, D. C. 20015.

OLD U.S. space-fillers, ½ Scott. Karl Swartz, Malden Bridge, New York.

200 DIFFERENT Stamps, 25¢. Smith, 508-A Brooks, College Station, Texas.

U.S. $8 Stamps free! Columbus issue, Pony Express, Antarctic Territory, Beatles, Tops Kennedy, etc. Send 10¢ for mailing. Empire Stamp Corp., Dept. PM, Toronto, Canada.

WOW! 1000 Different worldwide—valued over $20 only $1.00 with quality approvals. Universal, Box 6, Kenosha 5, Wisconsin 53141.

TERRIFIC Value, seven complete sets, 10¢ with approvals. Beatties, Box 16052, Tampa, Florida.

FREE 100 Worldwide with penny approvals. 10¢ handling. Skytop, Box 1022-PM, Binghamton, N.Y. 13902.

FREE! Gifts to adult collectors! Right now, without obligation, two marvelous Russian sets plus gift coupon with our sensational approval offer. Only 10¢ for handling. Trio Stamps, Box 1806-YM, Grand Central Sta., New York, N.Y. 10017.

BUILD Your collection to any size without duplicates. Club membership plan. Unusual stamps, lowest prices. Details free. Sjouist, 1435 Cherrydale, San Jose, Calif. 95125.

RUSSIAN Space set 10¢. Russian approvals. Sieden, Box 68-P, Waldwick, N.J.

U. S. MINT Parks 740-749 $2.00. Cooper, Box 3751M, Oak Park, Mich. 48237.

FREE 25 Rockets to new approval applicants. Tiquet, Box 1496, Denver 1, Colorado.

50 DIFFERENT Old U.S. Revenue stamps 50¢. Winchester Stamps, 45 Winchester Rd., Mansfield, Ohio.

FREE Congo, Rwanda, Monaco, Hungary, 50 Others. Approvals. Elkay Stamps, Dept. PM 1, 210 Jewett Ave., Jersey City, N.J. 07304.

FIPEX, Tipex, Cipex, Ashville. Four miniature sheets used for $1.00 if you ask for our bargain priced U.S. approvals. Triboro, 38 Park Row, New York, New York 10038.

133 DIFFERENT Colorful stamps 10¢, approvals. Krehl, 1708 Nebraska, Orlando, Florida.

FREE! Congo triangle set! Boy Scout beauty! 25 others, different. Approvals. Cambridge, Box 411, Cambridge, Ohio.

ONE Pound Bermuda, plus 100 World-Wide 10¢, approvals. Stevens, Box 105A, Homecrest Sta., Brooklyn 29, N.Y.

100 OLD United States between 1861 and 1935 $1.00. Roush Stamps, 51 Chestnut, Mansfield, Ohio.

FREE Sample. Interesting, illustrated, informative National Stamp News. Anderson, South Carolina 29622.

FREE U.S. catalog, mint Farley Parks 2¢/756-65. Rare with gum. $4.00 singles; $15.00 blocks. Simmy Co., 40 Court, Boston, Mass.

MAYFLOWER Stamp album 25¢. 407 illustrations. 64 pages. Approvals accompanying. Niagara Stamps, St. Catharines 701, Ontario.

FREE: 50 Turkey plus 25 Persia-Iran. Limited offer. 10¢ handling. Approvals. Berchtold Stamps, Troy, Ohio.

500 MIXED. Includes pictorials 25¢. Approvals. Knopp, Box 1381, Bristol, Conn.

225 STAMPS For only 10¢! This mammoth value includes airmails, pictorials; stamps from strange countries cataloging up to 25¢ each! Also approvals. Mystic Stamp Company, Camden 80, New York.

DEALERS Wholesale list. Postage 5¢. Frank, 5031 Queensberry, Baltimore 15, Maryland.

LITERATURE Free. Generous bargain lot: Sets, Packets, Pictorials $2 only. High value packet $3.00. Persile, 436 N.Y. Ave., Brooklyn 25, N.Y.

10 DIFFERENT Representative civil war confederate stamps, 10¢ approvals. Minuteman, 19 Deering, Lexington, Mass.

PHILATELIC Agents wanted. Earn stamps or cash by recommending our services. Write Collectors Corner, (ASDA), Tannersville, N.Y.

OLD Scarce U.S. seconds on approvals. Slight imperfections, lowest prices. Hernfield, Box 318, Irvington, N.J. 07111.

QUEEN Elizabeth on stamps—A beautiful collection of 40 different stamps from 22 countries—all bearing the portrait of the Queen of England. 10¢ with approvals. Roseland Stamps, Spring Lake, 2C, Michigan.

BEAUTIFUL Topical collection includes olympic sports stamps, wild animals, bicolor triangles, colorful birds, outer space stamps, Poland kitten stamp and others. 10¢ with approvals. Sunny Stamps, Fruitport 2B, Michigan.

GIANT Stamp collection including astronauts, satellites, moonrockets, boy scout issue. Complete U.N. set, many olympic & sport issues, etc., plus big stamp dictionary & approvals. Everything, 10¢! Stampex, Box 47-RM, White Plains, N.Y.

215 DIFFERENT Worldwide 25¢. Iceland, French Colonies, etc! Approvals. Coven's, 6000 Essex Avenue, Springfield, Virginia 22150.

FREE 400 Genuine postage stamps! Worth $10.00 at catalogue prices. Africa, Europe, Asia, British Emp.—a fascinating valuable mixture from foreign convents, banks, etc. Write now what you will find. Also free valuable booklet. Adults only. Approvals enclosed. Praek Co., PM-5, White Plains, N.Y.

100 BRITISH Commonwealth 10¢. Accompanying approvals. Niagara Stamp Co., St. Catharines 501, Ont.

100 DIFFERENT Stupendous worldwide 10¢. Attractive approvals. Linstamps, St. Catharines 401, Ontario.

ATTRACTIVE Set free. Worldwide approvals. Gorlin, Drawer 388PS, Park Ridge, Illinois.

215 DIFFERENT U.S. commemoratives, $1.00 approvals. H. Holub, 18 East 198th Street, Bronx, N.Y. 10468.

500 FINE Mixed U. S. 15¢. Wright, Box 753-M, Hagerstown, Maryland.

PENNY! Approvals! Regardless catalogue! Kloster, 4164 52nd St., San Diego 5, Calif.

FREE! 222 Worldwide 25¢ handling. Penny approvals. Jung, 1601 North Stanley, Los Angeles 90046.

FREE Stamps with approvals. Dick Phinney, 39 Cadet Drive, N. Ridgeville, Ohio 44039.

100 USED Independent African states airmailed, $1.00. Shiraz, Box 3080, Mombasa, Kenya.

507 DIFFERENT U.S., $6.50. Guaranteed. Bargain Lists. Yntema, Jamestown, Michigan.

FREE—Mammoth collection, $10.000 airmail, world's smallest stamp, Scott's international, master global albums. Given approval buyers. Bargain Stamps, 1000E, Camile, Santa Ana, California.

PAKISTAN 50 Different, 20¢. Catalogs over $2.00, only to applicants for attractive approvals. Old Colony, Dept. B, Palmetto, Florida.

110 DIFFERENT U.S. free! Inexpensive approvals. Bargain lists. Dime postage. Yntema, Jamestown, Michigan.

AUSTRALIA, 50 Different 10¢, 100 different 25¢. Farrell, Box 231, Plainview, New York 11803.

100 DIFFERENT Free! ½¢ Upwards British Commonwealth or world approvals. Bush, Newlyn Way, Poole, England.

ETHIOPIA. Our stock of mint Ethiopia is complete. Want lists solicited. Ethiopia Associates, Box 341, Ashland, Oregon.

U.S. Approvals. Selections that are refreshingly different; priced realistically. 20¢ buys mint #797 and 50 different used Stamps. Box 8, Lowell, Michigan, 49331.

300 DIFFERENT Given free with approvals. Particulars. Windsor Stamps, 1937 Fruitvale, Oakland, California.

CANADA Sports complete, 10¢. Canada approvals. Valley Stamps, Little Valley, New York 14755.

THREE Giant multicolored space sets, 10¢. Approvals. Stamp Farm, 1M1, Oxford, Wis.

FREE! Mystery, stamp packet. Approvals, premiums. Dancer, 75-P59, Mansfield, Ohio.

WORLDWIDE Collection, $10.00 catalog value. 50¢! No Approvals. Trans-America Philatelic, Box 8-E, Kenmore, N.Y. 14217.

COLLECTORS Duplicates better: British Commonwealth, older foreign 100 for $1.00. Rhodenizer, 412 Elizabeth Avenue, St. John's Newfoundland.

$5.00 CAT. Val., 25¢. Approvals. H&D, Box 591, Shaw AFB, South Carolina.

CLEARANCE. Forty different packets, $1.00. No approvals. Norge, Ho-Ho-Kus, N.J.

INDIA 50 Different 5¢. Approvals. Hijop, Box 505, Norristown, Pa.

SELL Your surplus good grade stamps. Write, describing fully what you have. Vanroy Shirk, Lebanon, Pennsylvania.

COINS, TOKENS, CURRENCY

HIGHEST Prices paid immediately for coins. Send 10¢ for 1964/5 buying prices. Wilmot's, 1067 P Bridge St., Grand Rapids 4, Mich.

25 BEAUTIFUL Coins from 25 countries. Mostly uncirculated. Terrific assortment. $1.00. Hindley, Box 708, Aurora, Illinois.

RARE Silver Dollars, 1879, 80, 81 S mint $3.00 ea. Uncirculated. New Catalogue, 50¢. Shultz, Salt Lake, Utah 84110.

BARGAINS—Coins, supplies. Large list. 10¢ (refundable). Ron Parley, Metamora, Illinois.

TWENTY Page 1965 retail price list of USA and Canadian coins 10¢. Our retail selling prices on thousands of coins and coin collectors supplies. Bryson Incorporated, 612A White, Toledo 5, Ohio.

LARGEST Coin magazine. 288 pages, 50¢. Scrapbook, 7320-J Milwaukee, Chicago 31.

40 PAGE Illustrated United States and Canadian coin list 10¢. Stoney, 260 Washington, Boston 8, Mass.

COINS Magazine—world's largest seller! Latest coin prices. 25¢ for sample—1 year (12 big issues) $5.00. Water Street, Iola, Wisconsin 54945.

COIN Collectors—"Numismatic News" tells what your coins are really worth. Send 25c for sample or $4.00 for next 26 big issues. Water Street, Iola, Wisconsin 54945.

"S" MINT Lincolns! 25 Different—$2.50. 250 mixed—$6.25. Postpaid! Molzan, 3228 Fruitvale, Oakland, California 94602.

FREE Coin supplies! Giant coin list 10¢ (refundable). Economy Sales, Mansfield, Massachusetts.

COIN Date guaranteed. Restores dates on worn nickels, $1.00 bottle. Box 276F, Mooreville, N.C.

"S" MINT Lincolns now seldom found circulating, rapidly increasing in value. We offer 22 different "S" including extremely rare 1955S, only $1.60. 28 different Lincolns before 1940 plus fantastic 1960D small date, $1.60. Harris, Box 1147P, Oceanside, California.

U.S. Coins wanted. Free buying list available. Bedrin, 250 Fulton, Hempstead, N.Y.

4 BARBER Dimes, $1.00; 7 Buffalo nickels, $1.00. Doktor, 5028 W. Pico, Los Angeles, Calif. 90019.

CIVIL War specials: 1863 cent, $1.75; 1863 civil war token, $1.75; 1864 genuine confederate states of America $10.00 bill, $2.00. All three $5.00. Barcos, 31 North Clark, Chicago 60602.

FREE List early American authentic reproductions continental dollar $3.00. B. Gross, ANA Box 4387, Jersey City, N.J.

"AMERICANA Collection"! Large Cent, Two Cent, Three Cent, Album, 68 Pages of Coin and Supply Bargains $5.95. Hobby Sales, St. Paul 16, Minnesota.

SELLING Coins reasonable. Free list for return postpaid, stamped envelope. Gene Carlton, Chandler, Okla. 74834.

FOREIGN Minis. Send $1.00 for complete up to date copy and order your own coins. Report, Box 26, Saratoga, California.

25% DISCOUNT Coin books, folders, accessories. Catalog 25c deductible. Coins, Box Co., Glastonbury, Conn.

10 DIFFERENT Indian cents $2.25. Hutchinson's, Box T-6256, Philadelphia, Penna. 19136.

"S" MINT Lincolns! 25 different, $2.00. 50 different, $3.50. 35 different, $8.00, postpaid! John Finneran, 22166 North 6th St., Castro Valley, California.

8 DIFFERENT Mexican silver dollars $3.50. 100 foreign coins, $2.95. Pauline, 3530 W. Pierce, Phoenix 9, Arizona.

FAST Cash for coins, complete buying list. A.I. Co., 5703 North First Avenue, Tucson, Arizona.

NEW 50 page foreign coin catalogue, 10¢. Jolie, Rosslyn Heights, New York 11577.

UNSEARCHED Buffalo nickels: 40 $3.40, 400 $28.00. Schubert, Box 230-A, Ithaca, N.Y. 14851.

ONE Roll of fifty Indian head pennies, common dates, average condition, $10.75 a roll. Alan John Kennedy proof set, $16.00. Brookline Coin, 233 Harvard St., Brookline, Mass.

BRILLIANT Proof sets, 1956 $19.00, 1957 $10.75, 1958 $23.75, 1959 $13.00, 1960 $9.50, 1961 $8.00, 1962 $8.00, 1963 $9.50, 1964 $16.50; All nine, $112.50. 1964 Bermuda dollar, $3.00. Bebee's Numismatics, 4514 North 30th, Omaha, Nebraska 68111.

CANADIAN Coins. Send for Free price list. Coins of Canada, Box 2015 Agincourt, Ontario, Canada.

COINS, Tokens, paper money for sale. Price list, 25c. Canada Coin Exchange, 49 Queen East, Toronto, Canada.

MEXICAN Coins: 1¢, 5¢, 10¢, 20¢, 50¢, 1 peso, $1.50 per set. No C.O.D. Jaki Import Sales, Box 65, Mercedes, Texas 78570.

LINCOLNS—Different. 95, $4.00; 105, $5.00; 120, $8.00; All S Roosevelts, $3.00. Guaranteed. Bargain lists. Yotema, Jamestown, Michigan.

EARLY American authentic reproduction continental dollar $3.00. Free list. B. Gross, ANA Box 4387, Jersey City, New Jersey.

HUNDRED "S" Lincolns, $3.25; rolls "S" Jeffersons, $3.95. Taylor, Box 1068, Whittier, California.

LINCOLNS, 45 Different D and S mints, $4.50. 1955S uncirculated, 85¢. Mickey, Box 28, Brooklyn 11229.

INDIAN Cents, 10 different, $1.99. Free coin pricelist. Edel's, Carlyle, Illinois.

100 LINCOLNS 1909 up, $4.95. No two alike. Earl Sprague, Kingston Drive, Muskego, Wisconsin 53150.

ANTIQUES, RELICS, INDIAN GOODS, CURIOS

TONS Of antique gun parts and supplies. All reproduction muzzle loading guns. Send 50¢ for thick illustrated 11th anniversary catalog. Dixie Gun Works, Union City 12, Tenn.

ORIGINAL Antique telephones, illustrated catalogue 20¢. Telephone Company, Turtle Lake, Wisconsin.

SIX Arrowheads from six states, $2.00. George Smith, 9825 Conway Drive, Indianapolis, Indiana 46236.

ARROWHEADS 10 for $3.00. List free. Hyde's, Rosemar Rd., Parkersburg, W.Va.

ANTIQUES! Monthly magazine. Sample 25¢ or free circular. Antiques Journal, Uniontown, Penna. 15401.

SELLING 20,000 Ancient arrowheads, spearheads, etc. List free. Lear's, Glenwood, Arkansas.

HOBBIES AND COLLECTIONS

EUROPEAN And Nazi uniforms and equipment, medals and badges, all authentic and reasonably priced. Catalog with 600 illustrations $1. Der Alte Oberst, Box 1393, La Jolla, Calif.

AMERICAN Newspaper, complete, original, dated before 1880, $1.50. 25¢ stamps brings catalogue. D. R. Spaight, Bookseller Tall Timbers 1, Maryland 20690.

50 JUNGLE butterflies $2.00. Giant nature hobbies catalog 25¢. Collectors Wonderland, Box 1170, New York 8.

FIVE Military emblems and illustrated catalog, 25¢; 30 different 50¢; Foreign medal 50¢; add 10¢ postage. Hobbies, Box 71-M Rockaway 94, New York.

PRECIOUS STONES, MINERALS

SEMI-Precious uncut gems. Ten different for $1.00. Request list 30. Prospectors Shop, 201 San Francisco, Santa Fe, New Mexico.

EARTH Science. Rockhound's National Magazine. Subscription $2.50. Sample 35¢. Box 1357-PM, Chicago 90, Ill.

PHOTO FINISHING, CAMERAS, PHOTO SUPPLIES

COLOR Movie Fans! 8 MM expertly processed, 50¢ per 50 ft. including fresh Kodachrome Film. All mailed back next day. First Class. Craftsmanship guaranteed. Send exposed reel or request Free Mailers and Price List of complete services. Direct Mail Photo, Box 8322-PM, Pittsburgh, Pa. 15218

FREE Illustrated photographic bargain book. Central Camera Co., Dept. 1-E, 230 So. Wabash, Chicago, Illinois.

A FREE Kodak roll returned with each black and white or Kodacolor developed and printed, fast service, lowest prices, guaranteed quality send for free mailers. Economy Photo Service, Dept. P. M., Box 1111, Albany 1, N.Y.

FAST, Hi-quality finishing. Kodacolor rolls: eight jumbo prints $1.98. Twelve $2.49. Twenty $3.49. Reprints 15¢. Also low B&W prices. Custom Quality Studio, Box 4838, Chicago 80.

FOR LIMITED time from your color slide, 4x5 black and white negative and an 8x10 black and white print, $2.50 ppd. Bull Photo, Box 879, Hot Springs, Arkansas, 71901.

30 WALLET Photos, $1.25; 4—5x7 enlargements, $1.25; 2—8x10 enlargements, $1.50. Dick's Photo, Louisville, Ky. 40212.

AMAZING Values, film users write, Chai Photo Supply Co., 14-03 Berdan Ave., Fair Lawn, N.J.

TELL The more than 1,350,000 avid readers of Popular Mechanics about your products and services. It costs very little to place your classified message in front of these proven mail order buyers. For further details, write: C. A. Martin, Dept. 31, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

MOTION PICTURES AND SOUND EQUIPMENT

16MM Sound films features and shorts. Bedner, 5300 So. Talman, Chicago.

8MM MOVIES. 2"x2" Color Slides—biggest selection anywhere! World's Fair, railroad, antique automobiles, circus, World War II, Hollywood classics, travel, wild life and many others. 16mm, new, used films also. Big Blackhawk catalog free. Blackhawk Films, 424 Eastin-Phelan Bldg., Davenport, Iowa 52805.

FREE Catalog! Save on 8/mm.-16mm. film and supplies. Superior, 448 N. Wells, Chicago 10.

CAPTURED Nazi film. Guaranteed authentic. Sample 50¢. Sanford, Fairview, Pennsylvania.

16MM sound-projectors, films, new, used for sale. Free catalog. National Cinema, 71 Dey Street, New York City, N.Y.

LIMITED Offer: 8mm. sound-striping machine, ready with supplies, reg. $69.95, $49.95 Post paid, cash with order. 8 and 16mm. film processing service, duplicating. Photo equipment and supplies. Photo Shop, 614 Washington, Allentown, Pa.

BEST 16MM movies, books, supplies. Gaines (PM), 14544 Vanowen, Van Nuys, Calif.

MOVIE Film! Free catalog! ESO-R, 47th Holly, Kansas City 12, Missouri.

5,000 8-16 MM. Movie films. Free catalogues. International, Greenvale, N.Y.

COLOR SLIDES

TRANSPARENCIES Wanted! Learn freelancing. American Color, Box 46372, Hollywood, California.

NEW YORK World's Fair, 1964 exclusive set 100 35mm., 2"x2" color slides, $14.99 plus 28¢ postage. Biggest selection high quality slides available anywhere. Catalog free. Blackhawk Films, 424 Eastin-Phelan Bldg., Davenport, Iowa 52805.

BUSINESS OPPORTUNITIES

$400.00 MONTHLY Raising giant fish-worms. Soilless method. Charlie Morgan, Bushnell, Florida.

PLASTERCRAFT Molds, liquid rubber, plasters, flocks, candle supplies. Catalog and manual free. Blue Rapids Supply, Blue Rapids, Kansas.

WORLD'S Largest wholesale supply. Buy from 7853 American, European, Japanese wholesalers. Talismade suits from Hongkong, 123 dropship catalogs. Rockbottom prices. Free details. International Buyers, 216-MM Jackson, Chicago 6, Ill.

WANT To make big money at home? $10.00 profit in an hour possible with invisible mending. Make tears, holes disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details free. Fabricon, 1585 Howard, Chicago 26, Ill.

VENDING Machines. No selling. Operate a profit coin machine. Big earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMB Ensor Street, Baltimore 2, Maryland.

LIQUID Molding rubber, free information, Chaney's, 5415-A San Jose Blvd., Jacksonville 7, Fla.

SELL Champion, AC, Autolite spark plugs. Unprotected, electrical equipment 10,000 miles. 100% profit. Free sample. Spar Plugs, 1608-A Roberts, Houston 3, Texas.

OPERATE Home mailorder business. Vosacek Printing, 4444AI Ute, San Diego, 17, Calif.

RAISE Rabbits on $500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

HUGE Profits! Mail order importing. Free information. ITIS-PM-5, Box 454, Hollywood, Calif. 90028.

DOLLS! Dolls! Dolls! We teach you to make, repair, dress and sell. Study at home. Doll Hospital Learning, Free Model, Doll Hospital School, Studio MC-55, 11826 San Vicente Blvd., Los Angeles 49, Calif.

LEARN Landscaping and the growing of plants. Start a profitable business part or full time. Free information without obligation. Lifetime Career Schools, Dept. MC-55, 11826 San Vicente Blvd., Los Angeles, Calif. 90049.

AMAZING Manufacturing opportunity. Free list of manufacturing formulas. Prefer Oil Company, Fostoria 16, Ohio.

SPARE Time earnings. With your table saw, hatchet or jigsaw. Write: Workshop, A3800 Harney, Vancouver, Washington 98660.

SELL Advertising book matches. Write us today: we put you in business by return mail, handling complete line and book matches in demand by every business right in your town! No investment: everything furnished free! Top commissions daily! Superior Matches, Dept. EX-565, 7530 S. Greenwood, Chicago 19, Ill.

IMMEDIATE Profits with no capital or experience. Take orders for all magazine subscriptions. Friends and neighbors are your prospects. Write now for complete, free kit. McGregor Magazine Agency, Dept. CB5, Mount Morris, Illinois.

FREE Book "990 Successful, Little-Known Businesses." Work home! Plymouth 872Y, Brooklyn 4, New York.

SIMPLE, Pleasant, mailorder can net $12,000 year. Write Rutward, 2610 Bryant, Columbia Station, Ohio.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leaksealing. Money-making projects. Booklet, details free. Men only. National Potteries Company, Grand Rapids, Minnesota.

SELL Books by mail. 400% profit. Royal, Box 450-X, Cleveland 27, Ohio.

FREE Booklet! Profitable, spare-time business bronzing, Pearlkoting baby shoes! Complete set-up on credit. Kiktavi, Box 34861-B, Los Angeles, California.

TO $100.00 weekly! Mailing catalogs. Sample instructions, 25¢. Costar, GPO Box 972-PM, New York 10001.

BAKE New greaseless doughnuts in kitchen. Stores buy output. Start spare time. Profit 29¢ each. Small appliance. Free recipes. Montgomery, 3605 South 19th, Minneapolis 7, Minnesota.

STOP Throwing away boxtops! They're worth money! Some, 25¢! Inquire: "Boxtops-MB", Cedar Hill, Texas.

PROFITABLE Mail order business. Be independent. Details free. Ideal, Box 357-EA, Valley Stream, N.Y.

76 MILLION Prospects! Immediate profits! Selling Champion, AC, Autolite spark plugs. Precision reconditioned, silver-plated, guarantee 10,000 miles. Up to 398% profit. Free samples, details. Indy 500 Spark Plug Co., 4620 Braeswood, Houston, Texas 77035.

CONCRETE Facts: Cement Artists make big money. Home Shop—Simple Equipment—Copyrighted Methods and Formulas. Make Color and Marble Glaze beautiful Cement Pottery without molds. Wishing Wells, Bird Baths, Waterfall, Rustic Garden and Patio Items. Free illustrated Brochure, write Hollywood Cementcraft, 602 E. Athens St., Altadena, California 91001.

FREE "Franchise Profit Letter" tells how unique NFR service is helping thousands seeking profitable businesses. Write today. National Reports, W-528, 333 North Michigan, Chicago 1.

SECRETS! Secrets! Mail order success revealed by internationally famous expert who discovered how to make home business fortunes. Beginners: Get free copy "How to Make Money in Mail Order." Disclosure free advertising, profitable products, everything! No obligation. Write Mailco, 1554 Sepulveda, Dept. P-705, Los Angeles 25.

PACKAGE At home for profit! We supply everything. "Free home business details. HPC, 807HPK Sunset, Los Angeles 12.

REPAIR Hydraulic jacks. Details free. Write: Hydraulic Parts Supply, Box 3645, El Paso, Texas.

FREE Facts and descriptive bulletin. Be an air conditioning, refrigeration, and heating serviceman. High pay, jobs open everywhere. Graduate your own service business, no school or correspondence necessary. Write Dooley Trouble Shooter, 2016 Canton, Dallas, Texas.

"MAILORDER — Stop looking!" Get your own catalog! Methods, 1809-FD, Lafayette Hill, Pennsylvania, 19444.

START Your own business on credit. Your own boss. Hundreds of dealers making $100 to $300 and more weekly. We supply stocks, equipment on credit. 300 home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industrial firm. Write Rawleigh, Dept. E-U-PPM, Freeport, Ill.

$70.00 WEEKLY—home, spare time. Simplified mail bookkeeping. Immediate income, easy. Auditax, 3474la, Los Angeles 34.

MAKE $46 From square foot plywood: jigsaw necessary. Free details. Woodart, Bridgewater, Mass.

EARN Money raising fishworms for us! Write: Oakhaven-38, Cedar Hill, Texas.

HAWAIIAN Jewelry sells fast because it is new and exciting. Details free. Chandlers, Wailuku, Hawaii, Dept. 35.

MAKE $50.00 Daily! Sell air operated vacuum cleaners from home stations for $19.50. Your cost $9.50 postpaid. Free details. Inka Industries, 2401 Crocker, Houston 6, Texas.

I MADE $40,000.00 year by mailorder! Helped others make money! Start with $10.00—Free proof. Torrey, Box 3566-Y, Oklahoma City 6, Oklahoma.

BUILD Custom cases at home for profit. Get orders by mail. Complete mail-order instructions, everything. Free home business details. Customcase, 805CPK Sunset, Los Angeles 12.

IMPORT-Export opportunity, profitable world-wide mailorder business from home, without capital. Free trial abroad. We ship proven plan, for no risk examination. Experience unnecessary. Free details. Mellinger, J705, Los Angeles 90025.

MAIL Baby catalogs to new mothers for big profits! Details, catalog 25¢. Volz-PM, Ypsilanti, Michigan.

SHARPEN And serrate steak knives, scissors, mowing shears, etc., for profit. One low cost machine. Free details. Beaver Machine, Box 121, Gardena, California 90247.

MAKE $32 From 49¢ piece vinyl. PMA-1834 Edgeland, Louisville, Ky. 40204.

Piano Tuning learned quickly at home. Tremendous field! Musical knowledge unnecessary. Information free. Empire School of Piano Tuning, Box 327, Shenandoah Station, Miami, Florida 33145. (Founded 1935).

400,000 BARGAINS below wholesale! Many free. Liquidations, job lots, single samples. Free details. Bargainhunters Opportunities, Box 736-A, Holland, Michigan.

HOME Manufacturing opportunities. Formula catalog 10¢. Ideal, 179-P, Park Ridge, Illinois.

WATCH Repairing. Learn to repair American and Swiss watches in spare time at home. Tuition only $5 monthly. Diploma awarded. Free sample lesson. No obligation. Chicago School, Dept. YRA, Fox River Grove, Illinois.

MAKE Money from old tires. Operators clearing $400 weekly. Equipment costs $800. Get facts. Vulco Patents, Inc., 3511 N. Lincoln, Chicago 13.

HOW and where to raise capital. Details free. Financial, Box 785-PM, Springfield, Missouri 65801.

RAISE Capital money fast—easy proven sources—free particulars. Advisor, Box 48337-PM-1, Los Angeles 90048.

AMAZING Information on starting your own business. Details free. Snyder, Wyatt 4, Ind. 46305.

VACUUM Mold at home! Hundreds full 3-D plastic products. Big profit, new machineryless method. Free facts, samples. Nationwide Plastics, Box 23321-JE, Los Angeles 90023.

READ Progressive Mailtrade, the magazine that tells how to make money by mail. Good listings maple sugar special offer. Mailtrade, P.O. Box 357, Sheboygan, Wis. 53081.

MAKE 400% Profit selling books by mail. Specialties, Box 148A, Parkland, Michigan.

$6.00 HOURLY Possible with my instructions and plans. Details free. Jacobs Enterprise, 712 Willsie, Rapid City, So. Dak.

NEED More money? Unlimited opportunity in distributing products for home and industry. Details, write: Chandler, 3299 Cimalones, Hacienda Heights, California 91745.

PROFITABLE Office-homework! Refundable nationalized system, $1.00. Interstate, 37-1 Beach, Albany 9, New York.

PROFITABLE Catalog mailorder business! Vikari's, 468-PM, Third Avenue, Salt Lake City, Utah 84103.

$60.00 DAY. Manufacturing concrete posts. Costs nothing. 1803 Fremont, Rapid City, South Dakota.

BUY Appliances, cameras, watches, etc. at factory prices plus 10%! Free details! Cam Company, 436-13 Bloomfield Ave., Verona, N.J. 07044.

LEARN Correspondence school operation and management, put your own ideas across. Easy to understand operational guide. For information and trial offer write: Director, Dept. M-55, P.O. Box 652, Encino, Calif. 91317.

NET $250.00 week. Pleasant mailorder. Write Crestmore, 409 West Liberty Street, Rome, N.Y. 13440.

OPERATE Restaurant or diner. Free booklet reveals profitable plan. Write Restaurant Business School, Dept. EC-55, 1920 Sunnyside, Chicago, Illinois 60640.

FREE Copy money-making mail order newsletter. eddress Newsletter, 2207-F8 Southern Hills, Springfield, Missouri 65804.

INSTALL Burglar alarms without previous experience or costly equipment. Big profit. Free details. Nasco, 1107I Massachusetts, Dept. P705, Los Angeles, 90025.

MOTEL Opportunity. Franchising, financing available. Turnkey job, low investment. Economical rates assure high occupancy, exceptional profits. Prime locations. Contact Econo-Lodges, Inc., Box 796, Parsons, Kansas.

COPUBLISH "Mail Sale Advertiser," leading mailorder paper. Copy and details 25¢. Vanroy Shirk, Lebanon, Pa. 17042.

OPERATE Your own big paying business. Details free. Bickel's, 29623-A Hoy Road, Livonia, Michigan 48154.

BUY Food wholesale! Save 50%. Food. Box 183-B, Bloomfield, New Jersey.

PROFESSIONAL Mailorder manual proves you can make money in mailorder. Shows you how. Reveals no-nonsense secrets of "pros." $1.00. (Refundable). Best Book Company, 1175 York, Suite 18B, N.Y.C., N.Y. 10021.

FRANCHISES. A business for yourself. New directory $1.00. Franchises, Box 807, Clarksville, Tennessee.

IMPORT-Export business made easy. Complete setup service; not just instruction. Hermes, 152 West 42, New York City 10036.

SELL Information by mail. 2400% profit. Instructions, $1.00. Saxe, Milan, Ohio 44846.

TERRIFIC Moneymaking possibilities!! In Your Own Mailorder Stamp Business. Stampco, 116-PD South Nevada, Colorado Springs, Colorado 80902.

FREE Details, home mailorder write: Eldee, 106-B Cumberland, Lawrence, N.Y.

HOW To develop and cash in on ideas. Details free. Willis, Dept. PM5, Box 75142, Los Angeles, Calif. 90005.

MAILORDER Classified advertising, profits unlimited. Write: Franklin, Box 304P, Salem, Ohio.

RADIO Mail order. $50,000 in one month possible. No cost percentage plan. Walthay, Box 53-M, Los Angeles 90032.

YOUR Own mailorder business. W. L. W. Distributors, Box 62M, Struthers, Ohio.

WORLD'S Most unusual money making reports. Something really different. Write: Private Enterprise Reports, Box 16127C, San Francisco, California.

DIFFERENT! Outstanding profits from high quality mailorder businesses. 20 complete setup services. Not just instructions. Hermes Co., 152 West 42, New York City 10036.

MOULDED Monuments. One man operation. No machinery. Local materials. Franitex, Dyersburg, Tenn.

FREE Book: "609 Unusual, Successful Businesses." Box 51-PN, Des Plaines, Illinois.

BECOME Tax consultant. Our students earn $1,000-$3,000 every tax season preparing returns evenings. Accredited. State approved. National Tax Training School, Monsey A-2, New York.

HOW To get a business loan, finance capital, grants, cash to start a business. Free details. National Counselor, Box 2206, Harlingen 17, Texas.

DISCOVER How to build your second-income fortune. Get hundreds of plans worth thousands of dollars. Write, Daniel Evans, 1175 York, N.Y.C. 10021.

START Your own mailorder business with less than $20. Details 25¢, refundable. Campbell, Box 5295-A, Phoenix, Arizona 85010.

DIRECT Rock bottom wholesale sources! Buy for pennies! Sell for dollars! Free Details, Joric, Dept. 505, Box 66151, Portland, Oregon 97266.

WE Dropship cheap cameras, transistors, gifts: Indopuroonesian Export Post, Box 14429, Hong Kong.

READ Foreign Forum. Unique mailorder magazine! Copy, 25¢. Mounier's, 309 Armand, Ville Platte, Louisiana 70586.

INSTANT Traffic builders for retailers; fantastic profits. Hewig, Brooklyn, New York 11222.

AMAZING 400% Profit novelty candies, home made. Details 25¢. Smith, 2080 Wellington, Montreal.

FINANCIAL Freedom selling by mail; secret to success is importing at unbelievably low prices. W. Hooker, importer, 507-M 5th Ave., New York. Enclose quarter, postage and handling.

BIG Earnings full or spare time with new plastic shutters. Plus extra cash for installation. Every home a prospect! Free literature. Forms, Inc., Dept. P, 554 Adams St., Chicago, Ill. 60606.

HOW I make $50 day operating Ad Market. Free details. Ad Market, Box 331, Harlingen 11, Texas.

BOOKKEEPING System. Substantial profit selling Start Service. Kern, Box 263, North Hollywood, California.

LIFETIME Repeat business. Men, women. 100% profit, 20% overide. Details 35¢. Sales Kit, $8.95. Foster, P.O. Box 5144, Long Beach 5A, Calif.

SAVE Building costs, new material molded on site. 7217 Lisbon, San Diego, Calif. 92114.

SAWDUST. Tin-cans, newspapers. 200 uses. Instructions, $1.00. Charles Company, 42-CPF, Norwood, Ohio.

MAKE Money, booklet explains you can make profits tells you with many money making ideas. 35¢. Washington, 1506 Filbert St., Oakland, California.

OPERATE Home collection agency, details. Livingston's, Box 5332, North Charleston 1, South Carolina 29406.

100% PROFIT Possible! No risk. Learn how to invest in coins. James N. Mitchell Co., P.O. Box 121, Auburn, New York.

MAILORDER Profits and pitfalls revealed to you by experts. Write T. Potts Company, 218 Madison, Huntington, Indiana.

NEWEST, Hottest, moneymaker. Thriving prosperous 25¢ coin operated car washwax business. Big profits. Deal direct with leading manufacturer. Write: Porta Service, 208 Fourth 49th St., Belleville, Ill. Immediate reply.

MAILORDER! Dollar-Pulling letters. 25¢. Rein, 32 New York, Freeport 20, New York.

ENTER The advertising business. Calendars, imprinted gifts. 1100 Items. Large weekly commissions. Permanent future. National Company, Dow, 1714 Stockton, San Francisco.

MAILORDER Catalogs. No inventory required. Discounts 40% up, postpaid. Send 25¢ for 32 page sample catalog, featuring 150 unusual, fast-moving products and complete details. Satisfaction guaranteed. Gaylords, North Adams 7, Mass.

BIG Money raising fishworms and crickets. Free literature. Carter Farms, Plains, Georgia.

MONEYMAKING OPPORTUNITIES

MAKE Plastic novelties for extra income. Low cost home training now available. Write for free booklet. Interstate Training Service, Dept. D-3, Portland 12, Oregon.

MAKE Money writing short paragraphs! No tedious study! I tell you what to write, where and how to sell, and supply list of editors buying from beginners. Many small checks add up quickly. Write to sell, right away. Send for free facts. Benson Barrett, Dept. C-27-DA 6216 Clark, Chicago 26.

RAISE Rabbits and fishworms on $500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

START Your own home mailorder business, sparetime! Easy! Fascinating, profitable! Alfano, 19-FM Pine, Closter, New Jersey.

LEARN The secrets of repairing junk batteries. "Fabulous Profits" at home. Details. Batteryman, Prunedale P.O., Salinas, California.

UNUSUAL Moneymaking opportunities. Free literature. Eaton's, 708PM Gold, Centralia, Wash. 98531.

MAKE Figurines, plaques, lawn ornaments, Molds, plastercraft kits, liquid rubber. Sample and catalogue 10¢. Wooley Company, Box 29-B, Peoria, Illinois.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMM Ensor Street, Baltimore 2, Maryland.

MAILORDER! $25.00 Orders! Keep $16.67! Distributing $3.25 product. JanMar, Box 572-M, Washington, D. C. 20044.

EARN Money evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle-1, Wisconsin.

BECOME A Notary Public! Win extra income, prestige, business contacts. Details free. Stationers Exchange, P.O. Box 617, Kilgore, Texas 75662.

CIGARETTES. Make 20 plain or filter-tip for 9¢. Factory-fresh pipe tobaccos. Mild tropical flavored Philippine cigars. Pacific free. Moberly, Box 904, Owensboro, Kentucky.

SELL Titania gems: more brilliant than diamonds. Catalog 10¢. Diamonite, 2420-G 77th, Oakland 5, California.

EARN $240.00 a month at home, spare time, doing only two $4.00 invisible mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free. Fabricon, 1532 Howard, Chicago 26, Ill.

OPPORTUNITIES 501 Ways to earn money. Part—full time, young—old, men—women. Free information. Opportunities, Box 1331, Merchantville, New Jersey.

MINK Raising information free. Lake Superior Mink Farm Inc., Superior, EE1, Wisconsin.

WATCH Repairing. Swiss and American watches. Develop skill step by step in spare time at home. Tuition only $5 monthly. Diploma awarded. Free sample lesson. Chicago School, Dept. YRB, Fox River Grove, Illinois.

FABULOUS Mailorder. Can net $10,000 year. Budget. Box 501P, Monterey Park, Calif.

BIG Money raising fishworms and crickets. Free literature. Carter Hatchery, Plains, Georgia.

NEW Instant invisible mending. Learn in one hour, repair in five minutes. Make $150.00 week. Literature free. Louis Rosenstein, P.O. Box 6136-8, Philadelphia, Pa. 19115.

INSTANT Money! Plastics are the wave of the future. Big profits now! At home! Spare time! Materials costing 1¢ bring $2.58 profits immediately! Free information! Rush name on postcard to: Warner, 1512 Jarvis, Dept. CL-2-DW, Chicago 60626.

OVER $10.20 an hour. Spare time at home! Rubber stamp industry needs small manufacturers. We furnish all equipment and know-how! Particulars Free! Write: Roberts, 1512 Jarvis, Room CR-2-DW, Chicago, 60626.

CASH From leathercraft. Free booklet tells how. Tandy Leather Co., Box 791254, Fort Worth, Texas.

YOUR Own business. No inventory required. Suppliers ship for you. Details. Jenkins Publications, Box 1490, Oceanside Cal. 92057.

AMAZING Income from ideas. New manual tells how. Free details. Thompson, 9414 Aspen, Shreveport, La. 71108.

CAPITAL Available—ready prime sources, details free. Advisor, Box 48337-E, Los Angeles 90048.

HOT Money making line! Show line of business printing, advertising specialties, calendars. Watch orders pour in. All repeat items. Terrific commissions in full or spare time. No experience, no investment. Cash discounts to customers. Free bonus gifts to you. Free sales kit. Williams-Lavid Lionel Press, Dept. W-27, Waukegan, Illinois.

AMAZING Successes through franchises! Become exclusive franchise holder your territory. Information rushed. National Franchise Reports, WP-528, 333 North Michigan, Chicago 1.

PROFITS Unlimited using your ideas. Details free. Kelly, 1012 Windsor, Santa Cruz, Calif. 95062.

WE Purchase items you make at home for us. Send stamp for details. Wolfe Specialties, Box 171, Center Line, Michigan 48015.

TURN Water into money. Amazing drinking glass demonstration sells restaurants, hotels, industry, homes. New and non-caustic invention eliminates clogged drain pipes; banishes septic tank and grease trap problems forever. Huge untapped market. Big repeats. Higher commissions. Details Free. Write Dick Watts, 35 S. 19th Ave., Dept. 455-C, Maywood, Illinois.

EASY Cash earnings from your ideas. Free details. Lachmann, 2144-D Esplanade Place, Gretna, Louisiana.

MAILORDER Business "newsletter" absolutely free. Wilko, 5050-H Windsor, Chicago, Illinois 60630.

BUILD Fishing pole & rod holders for pennies each to use or sell. Use from bank or boat. Plans 25¢. E. E. Edwards, Ardmore, Tenn.

$25.00-$75.00 Weekly Possible Clipping Newspaper Items. (Spare time). Details free. Graham, 1255-N, Englewood, Colorado 80110.

WIN Cash prizes! Exciting magazine brings you monthly puzzle contests, aids, information. Year's trial, $1.00. Sample, 25¢. Prizewinner, Box 11569, St. Petersburg, Fla.

MONEYMAKING Mailorder details 10¢. Pat, 270 East 60th Street, Hialeah, Florida 33012.

LOANS To little businessmen. Start or expand. Free details. David Magee, Box 331, Harlingen 5, Texas.

PROFIT—Mail our catalogs. Write McBride, Box 5383, Lubbock, Texas.

CO-PUBLISH Successful mail order magazine spare time. Minimum capital. Sample copy, full details, $1.00. Transworld Association, 1730 Hamlet, Las Cruces, New Mexico 88001.

PART-Time photographers earn $100 to $300 per month. Book of 20 proven methods, $2.00 postpaid. Unicam, Box 7272, Dallas, Texas.

TRAVEL And get paid for it! Free information. Write: Baer, 614 Washington, Genoa, Ohio.

FREE. Four steps to successful selling by mail; limited printing. Hurry! W. Nooker, 507-B 5th Ave., New York.

SIGNS Easily painted by you with our letter patterns, supplies, raised letters. Paulow, Crystal Falls, Michigan, 49920.

COLORFUL West Indies primitive rope string beads for unusual curtains or room dividers. $5.00 down in quantity orders. Sample string, $1.00. Primitive Artisan, 303 West 42nd Street, New York 10036.

MAKE Money yourself, not for others. Details free. Ashe's, Box 63, Elmhurst, N.Y.

YOU Learn window trimming in 1 book. Free details, write: Box 357, Whittier, Calif.

$1000 MONTH Possible. Executive-style mail order business. Tired of losing money? Be the fellow who starts the little fellow in his own business. Free details. Advertiser's Planning Service, 150 Broadway, Dept. M-1, New York, N.Y. 10038.

WRITE For pay! I do. Particulars. Ralph Underhill, Beebe, Arkansas 72012.

EARN $1000.00 month operating Bookkeeping Tax Service. Details free. Universal Bookkeeping, Box 664, Springfield, Missouri.

START A profitable subscription business in spare time! We need men and women (young and old) as representatives for all leading mail order magazines. Liberal commissions on all subscriptions. Supplies free. No experience needed. Send like and with your name and address to: Popular Mechanics, Room 3-O, 250 W. 55th St., New York 10, N.Y.

PROFITABLE OCCUPATIONS

WHOLESALE Magazine subscriptions. Highest commissions. Bonus! Box 1512A, Freshmeadows, N.Y. 11365.

BECOME Independent with your own franchise business. Thousands earning handsome incomes. Request interesting facts today. National Franchise Reports, PM-528, 333 North Michigan, Chicago 1.

CHROME Plating. Instructions, equipment and supplies. Platers' Supply, P.O. Box 565, Lusco Station, Los Angeles, Calif.

YOUR Own sign shop—Signs, 1017 W. Mulberry, Springfield, Ohio.

BAKE New greaseless doughnuts in kitchen. Sell stores. Free details. Michael, 3603 South 15th, Minneapolis 7, Minn.

RAISE Pheasants on $100 week plan. Little capital and space can make you independent. Free details. Great Central System, Columbus 1, Kansas.

BIG Money raising fishworms and crickets. Free literature. Carter Wormery, Plains, Georgia.

EARN $240.00 A month at home, spare time, doing only two $5.00 invisible-mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free Fabricon, 1586 Howard, Chicago 26, Ill.

AUCTIONEERING—Resident and home study courses. Auction School, Ft. Smith, Ark.

SHARPEN—Scissors, pinkers, tools. Inexpensive machines, supplies. Blackhawk's, Sheldahl, Iowa.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 751 PMP Ensor Street, Baltimore 2, Maryland.

INVESTIGATE Accidents. Earn $750 to $1,400 monthly. Car furnished. Expenses paid. No selling. Six college education necessary. Pick own job location. Investigate full time. Or earn $8.44 hour spare time. Men urgently needed now. Write for Free Literature. No obligation. Universal, CPM-5, 6801 Hillcrest, Dallas 5, Texas.

MANAGE Motel or resort. Man, woman, couple—make high income plus apartment. Pick your own location with our employment assistance. Learn at home. Free booklet. Motel Managers Training School, Dept. PMC55, 612 South Serrano, Los Angeles, California 90005.

$15.00 TO $30.00 an hour de-liming steelbeam and laminated arch. Little competition, large profit, total investment less than $100.00. One steamcleaner coil can pay for total investment. Write for free information. Champaign Coil Company, 305 West Springfield Ave., Urbana, Illinois 61801, Dept. 5.

OIL Reclaiming, Plans, $2.00. Holcomb, Box 681, Pampa, Texas 79066.

FREE Book "990 Successful, Little-Known Businesses." Work home! Plymouth 87Y, Brooklyn 4, New York.

MAKE A living with your camera, postpaid $3.25. Photo Service, Box 2521-X, Hollywood, California 90028.

INSTANT Traffic builders for retailers; fantastic profits. Marvic, Brooklyn, New York 11222.

MAKE Money writing short paragraphs. Information free. Barrett, Dept. C-27-DB, 6216 No. Clark, Chicago 26.

START A magazine subscription business. Earn generous commissions on Popular Mechanics, Good Housekeeping and all others. Best commissions, bonus, all material sent free. No experience needed. Write Popular Mechanics, Room 5-P, 250 West 55th St., New York 19, N.Y.

AGENTS WANTED

ESTABLISH Your own business. Low prices on wearing clothing, shoes, household goods. Unlimited profits. Free catalog. Northwestern Distributors, 2128 No. Western Avenue, Chicago, Illinois 60647.

SALESMEN Make big profits selling "do-it-yourself" sign kits to merchants. Information free. Signmakers, Inc., Dept. PM4, Box 6626, Denver 16, Colorado.

RAISE Rabbits for us on $500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

FABULOUS Opportunity for women, any age. Earn $25 day or more as beauty advisor. No experience. Exclusive, sample Hollywood cosmetics: Studio Girl, Dept. OP-40, Glendale, California.

MAKE Up to $50.00 daily soliciting delinquent accounts. Terrific commissions. General Credit Co., Dept. L-6, Pickwick Bldg., Kansas City, Mo. 64106.

AGENTS, 400% Profit selling 25 letter collection book to stores, offices. Retails for $19.98, sample $1.00. Mutual adjustment Bureau, Inc., 505 Fifth Ave., N.Y.C.

PRINTING. Advertising salesmen—Excellent moneymaking sideline selling decalcomania name plates, small quantities, automobile initials, sign letters. Free samples. Ralco, XL, Boston 19, Mass.

CASH Or U.S. stamps for recommending our services. Write: Collectors Corner, (ASDA), Taneyville, N.Y.

YOUR Own business—Used suits $1.50; overcoats 6¢; machines 35¢; shoes 12½¢; ladies coats 30¢; dresses 15¢. Enormous profits. Catalog free. Nathan Portnoy Associates, 2109-AA Roosevelt Road, Chicago 8, Ill.

SALESMEN—DISTRIBUTORS

SENSATIONAL New longer-burning light bulb. Amazing free replacement guarantee—never again buy light bulbs. No competition. Multi-million dollar market yours alone. Make small fortune even spare time. Incredibly quick sales. Free sales kit. Merlite (Bulb Div.), 114 E. 32nd, Dept. C-73J, New York 16.

FREE To salesmen who want more money. Send name, age and occupation for free copy Opportunity Magazine describing 200 new, fast-sellers. Entirely free. Opportunity, 850 N. Dearborn, Dept. 17A, Chicago, Illinois 60610.

DISTRIBUTORS Wanted. Stainless razor blades. Bulk. Box 34, Princeton, Florida.

SELL Advertising book matches. Write us today, we put you in business by return mail; handling complete line of book matches in demand by every business right in your town! No investment; everything furnished free! Top commissions daily! Superior Match, Dept. M-565, 7330 S. Greenwood, Chicago 19, Illinois.

HOT Money making line! Show line of business printing, advertising specialties, calendars. Watch orders pour in. All repeat items. Terrific commissions in full or spare time. No experience. No investment. Cash discounts to customers. Free bonus gifts to you. Free sales kits. Willcut-Duval Lionel Press, Dept. W-28, Waukegan, Illinois.

ASTONISHING Automatic toilet bowl cleaner, deodorizer. Works when toilet is flushed. Housewives buy on sight for every bathroom, at only $1.98 each. Make up to $10.00 in hour, spare time. Sales Kit, Merlite, 114 East 32nd, Dept. G-71J, New York 16.

CALENDARS. Novelties. Full or part time. Liberal commissions. Fleming, 6535-A Cottage Grove, Chicago 37.

EARN Extra money selling advertising book matches. Free sample kit furnished. Matchcorp, Dept., PM-55, Chicago 32, Illinois.

LONG Needed invention. Man to contact service stations. Huge profits. Cyclo Mfg., 3816 Dahlia, Dept. 128, Denver 1, Colo.

25% COMMISSION. Sell tricks, jokes, toys. In your own, full or part time wholesale novelty business. Free catalog now, send $15.00 for deluxe case, samples, instructions. Otis Novelty Company, Dept. 305, Wilmette, Illinois.

PRINTING Office supplies, rubber stamps. Save 50%. Send $2.00 for confidential list. Modern, Box 3F, Southfield, Michigan.

$1,000.00 a month for making dramatic 3-second demonstration of amazing Lightweight Instant Fire Extinguisher. New chemicals used by Airforce snuffs out fires instantly. Only $4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-66J, New York 16.

EMPLOYMENT INFORMATION

MERCHANT Marine. Men, women, ships and boats. High wages. Travel. Captain, Box 501-P, Reading, Massachusetts.

DIRECTORY Reports. Construction, aviation, shipping, oilfields, government, manufacturing, trucking, etc. Foreign—stateside. Helpful information plus job-getting tips on preparing professional letters. Unconditional money-back guarantee. Only $3.00 ($3.25 airmail) Research Services, Box 6768-PM, St. Louis, Missouri 63144.

TREMENDOUS Job opportunities. Foreign-U.S.A., construction, trucking, manufacturing, government, shipping, thousands more. Up to $2,000.00 monthly! Money-back guarantee. Directory plus application forms. Send only $2.00. Worldwide Opportunities, Box 730-A, Holland, Michigan.

MEN. Women needed for Civil Service Employment. Write: Employment Opportunities Service, Box 3392, Boardman, Ohio 44512.

UPGRADE Yourself. Earn More. Contact key men in companies near you hiring in your field. We supply names from our datafiles covering over 2,000 locations. $2.00. Specify field. Detwiler, Box 1894, New York, N.Y. 10001.

FOREIGN Employment. Construction, other work projects. Good paying overseas jobs with extras, travel expenses. Write only. Foreign Employment Bureau, Dept. PM, Bradenton Beach, Florida.

TREMENDOUS Opportunities, U.S.A. Overseas, choose jobs, locations, transportation. Free detailed information. International Airport, Box 100-C14, Jamaica 30, N.Y.

OVERSEAS, Foreign employment. Permanent. High paying U.S. occupations. Transportation. Family resettlement. Sixth successful year providing immediate direct placement. Fast service. Global Employers, Box 286-A, Oroville, Calif.

TRUCK Drivers instruction manuscript, copyrighted, $3.00. Superior Services, 434 Wilbur Avenue, Swansea, Mass. 02778.

BOOMING Australia needs your skills. Government-assisted passage, if qualified. Details, free. Unconditional money-back guarantee. Irving Heyer, 2913 Chestnut, Costa Mesa, Calif.

CIVIL Service jobs! How to qualify. Base, Box 11206-K, Philadelphia, Pennsylvania 19117.

JOBS, Ships. $100.00 weekly. Beginners, men, women. Information. Seamans Service, Box M, New York 21, N.Y.

MUSIC AND MUSICAL INSTRUMENTS

ITALIAN Accordions Manufacturing. 6343P, So. Ashland, Chicago 36, Illinois. Piano, Chromatics, Hohners, Concertinas. Wholesale catalogs free.

PIANO Self-Teaching Book. Includes popular, classical, harmony, theory, chords, scales. Price $5.00. LaPont Publishing Company, Box 606-P, Franklin, Michigan 48025.

PLAYER Piano books. Free catalog. Vestal Press, Vestal 11, N.Y. 13850.

SONGPOEMS Wanted. Send poems for offer. Nashville Music Institute, Box 532-PM, Nashville, Tennessee.

RECORDS! Discounts on all LP's. Free details. Citadel Record Club, 545 Fifth Ave., Dept. 2, New York 17, N. Y.

POEMS Wanted for musical setting and recording. Send poems. Free examination. Crown Music Company, 49-C West 32 Street, New York 1.

2500 UNUSUAL Hobby, party records, others; free catalogue. Record Suppliers, 90 Chelsea, Lexington, Kentucky 40507.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PMM, Covina, Calif.

FREE Recording, your songpoem. For information, send poems. Musicraft, 6718 Hollywood Blvd., Hollywood, Calif. 90028.

SONGS Poems wanted. Accepted songs published recorded at our expense. Ted Rosen, 17 Longwood Road, Quincy, Mass.

GUITAR, Banjo Making books, Plans, Moods, necks, tools. Lists 15c. Stainwood, 510 East 11th Street, New York 9, N.Y.

POEMS Wanted for new songs and records. Send poems. Five Star Music, 6M Beacon, Boston 8, Mass.

POEMS Wanted for musical setting and recording. Send poems. Free examination. Crown Music, 49-C West 32, New York 1.

SONGPOEMS Wanted! Collaborate with professionals. Free publication, equally. Share royalties. Songwriters Contact, 1619-D, Broadway, New York 19.

ACCORDIONS—Save ½. Standard and Electronic. Free Trial. Easy Terms. Trades. Free Discount Catalog. Accordion Corporation, 5535 Belmont, Dept. R, Chicago, 60641.

VIOLIN And guitar makers, send for latest Free catalogue of woods & accessories. International Violin, PM-5, 414 East Baltimore St., Baltimore 2, Md.

GUITARS. Big discounts. Famous makes. 5-Day trial. Terms. Free catalog. Guitar World, 2001 Chicago Avenue, Dept. R, Chicago, 60625.

SWISS Musical movements. Mechanical-electrical. Spielman, 131 West 42nd, New York 10036.

SONGWRITERS. Send for composing offer. Modern Music, Box 193-A, Bloomfield, Conn.

GUITARS, $11.95. Electric double pickups, with tremolo bar, $49.95. Accordions, $125.00. Concertinas, $350.00. Drums pearl set, $99.00. Wind instruments, $39.95. Free catalogs. Melody Music, 4951 W. 95th St., Oaklawn, Ill.

SONG Ideas wanted. Write with active professional songwriters with publisher contacts. Records made. Share royalties. Send ideas—free examination. Songwriters' Associates, 236 W. 55th, N.Y. 19-P.

RADIO, TELEVISION AND ELECTRONICS

GOVERNMENT Surplus electronics, infra-red equipment. Catalog 20c. Meshna, Nahant, Mass.

$1.00 DELIVERS plastic packets for 60 QSL's. Tepsbco, Browne Blvd., Gallatin, Tennessee.

TAPE Recorders, hi-fi components. Sleep learning equipment, tapes. Unusual values. Free catalog. Dressner, 1523 Jericho Tpke, New Hyde Park 3, N. Y.

MC GEE Radio Company. Big 1965 176 page catalog sent free. America's best values, hifi—amplifiers—speakers—electronic parts. 1901 McGee Street, Dept. PM, Kansas City, Missouri.

PROFESSIONAL Quality tape deck. Build yourself at amazingly low cost! Detailed plans tell how. Guaranteed. Exciting particulars free. Pepke Laboratories, 930-C West 19 Street, New York, N.Y. 10011.

33¢ RADIO & TV tubes. Free list. Cornell, 4213-17 University, San Diego 5, California.

BRAND New tubes. World's lowest prices on radio, TV-industrial, special purpose tubes. Write for free parts catalog. United Radio, Newark, N.J.

HI-FI components, tape recorders at guaranteed lowest will be undersold, prices all nationally advertised brands. No catalogue, quotations free. Hi-Fidelity Center, 179(PM) 1st. Ave., New York 10028.

SAFEGUARD Privacy! New instrument detects electronic "bugs," wire-tapping and snooping devices. Free information. Dee Equipment, Box 7263-E4, Houston 8, Texas.

FREE Electronics catalog. Tremendous bargains. ElectroLabs, Department C-624B, Hewlett, New York 11557.

TRANCEIVERS 100 MW. Send $150. Lanner Raker, 311 Westwood Drive North, Minneapolis, Minnesota.

32 PAGE Citizens band catalog. All major brands and accessories. 10¢. Dealer inquiries invited. Knox Electronic, Dept. PM4, Galesburg, Ill. 61401.

NEW Magnetic Device; Engineers, inventors, experimenters, hobbies, latest theory in basic magnetism. Create new products by experimenting with the magnetic ladder acceleration solenoid using D.C. power. $1.00. Jesse Costa, Box 26, Waquoit, Mass. 02570.

SAVE Money on TV and radio repairs. Free catalog. Telefixit, Box 714, Manhasset 1, N.Y.

YOUR Ad in this space will be read by more than 1,350,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a classified ad. For further details, write: C. A. Martin, Dept. 41, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

SCIENCE & CHEMISTRY

CHEMICALS, Apparatus, Biology. Catalog 25¢. Mid-States Scientific, 7053 N. Clark, Chicago, Ill.

ROCKETS! Flight kits, testing equipment. Catalog 25¢. Rocket Development Corporation, Route 3, Seymour, Indiana.

LIQUID Fuel rocket, 10 lbs. payload to 6000 ft. complete plans only $2.98. Missile Research, 517 Elder, Anaheim, California.

AMAZING New book of science experiments, formulas, and catalogue of laboratory supplies. Only 35¢. National Scientific Co., 13 So. Park Avenue, Dept. PM-5, Lombard, Illinois.

CHEMICALS And apparatus for industrial, analytical, and private laboratories. Catalog 25¢. Dept. M-50. Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N.Y.

ROCKET Catalog and fuse sample. 25¢. Central Rocket, Waupaca, Wisconsin, 54981.

ROCKETS: New illustrated catalog 25¢. Single and multistage kits, cones, engines, launchers, trackers, technical information, etc. Free list. Estes Industries, Penrose 7, Colorado.

SEARCHING For economically priced chemicals and apparatus? Gift with catalog, 25¢. Star Scientific, Manitowac, Wisconsin 54220.

FREE. Science catalog. Chemicals, glassware, physics, biology. Frey Scientific, 465 S. Diamond, Mansfield 1, Ohio.

ILLUSTRATED Catalog: Chemistry, mineralogy, biology 25¢. Tracey Laboratories, Evanston, Illinois.

CONTACT Explosive. Explodes with slightest touch when dry. Ideal for jokes. Powerful. Handles safely wet. Make all you want from household chemicals. Complete instructions and formula, $1.00. Franks, Scientific Co., P.O. Box 1192, Corinth, Mississippi.

FIREWORKS. Fuse 10 feet, formulas, catalog, $1.00. Mailmart, Soquel, Calif.

"RIGID-Structure Atomic Modeling," $1.00; "The Third Science Monotronics," $1.00. Monotron Press, Box 3332, Laramie, Wyoming.

FUSE, 15 ft., $1.00! Also, 35 Firework and rocket formulas, $1.00! S & C Labs, 21863 Colgate, Farmington, Mich.

SKYROCKETS, Firecrackers, fireworks —Make your own! 60 simple formulas 1.00. Paloma Pyrotechnics, P.O. Box 247, Auburn 3, California.

UNDERWATER Fuse 3/32" diameter, 25 feet $1.00 postpaid. Rigley, Box 138-F, Addison, Mich.

FORMULAS, PLANS, ETC.

FORMULAS—All kinds. Amazing big catalog, 10¢. Kemikal, Park Ridge, Ill.

AUTHORITATIVE Encyclopedia: formulas, processes, trade secrets. Free literature. Cassell, P.O. Box 1535, Eugene, Oregon 97401.

FOR Proof of what you can do in specialty manufacturing get our literature. It's free! Miller, Chemist, 1517-P, Tampa, Florida.

LATE, Modern manufacturing formulas. List free. Moon Chemical, Martville, New York.

10,000 TRADE Secrets, recipes, formulas & processes, most valuable book you can own. $5.00. Dunn, P.O. Box 709, Arkadelphia, Arkansas.

PROFITABLE Manufacturing formulas. Literature free. Ponteese, 2625 South Eighth, Terre Haute, Indiana.

YOU Can make amazing profits in specialty manufacturing. For proof get our literature. It's free. National Chemicals, Box 4485, Ft. Worth, Texas.

MONEYMAKING Trade secrets, formulas. Free Details. Ken's, 565-B, Fairbury, Illinois 61739.

FREE Fuse! Split giant logs easily! Details. 20¢. Nitropower, B-1701, Altadena, Calif. 91002.

10,000 CHEMICAL Formulas and trade secrets. Information, everything imaginable. $1.00 Postpaid. National Chemical Research, 5117 Nicholas, Omaha, Nebraska 68132.

FREE Folders fully describe our many hundreds of formulas and plans for homework and profitable small-business enterprises. Western Chemicals, Box 19718-C, Los Angeles 90019.

PLASTICS

BOXES. Plastic. 200 sizes. Free list. Althor, 2260 Benson Ave., Brooklyn, N.Y.

NEW Liquid casting plastic clear colors. Embed real flowers, butterflies, photos, coins. Catalog two cents. Handbooks: "How to Cast Liquid Plastics" and "How to Make Extra Money at Home." Castolite, Dept. 101E, Woodstock, Illinois.

PLASTIC Embedders, jewelry workers. We have everything. Findings, moulds. New catalog 25¢. David Co., 20 Garden St., Dept. M, Providence 3, R.I.

EXPORT—IMPORT

OVERSEAS Products, addresses 100 names, $1.00. McKnight, 604 Ave. D, Redondo Beach, California.

FREE Directories, magazines, 30 countries! Import-Export, Box 11, Aberdeen, South Dakota 57401.

SHOP World wide by mail. Free brochure. Mendes Imports, Box 195, Middletown, R.I.

IMPORT We help you, we don't sell you, no course, no membership fee, direct connections. Information, $2.00. J. C. Moore Co., 7715 Oak Drive, Wonder Lake 5, Illinois.

JAPAN: Mail-Order 26 page catalog, dolls, novelties, Manufacturers' names, addresses $1.00; 1000 products illustrated trade directory $3.00. Send cash. Yamasata Office, 814 Togin Bldg., Marunouchi, Tokyo.

BUY IT WHOLESALE

100,000 PRODUCTS Wholesale! Terrific bargains! Wholesalers, 1365-MR Broadway, New York, N.Y.

WORLD'S Largest wholesale supply. Buy from 7853 American, European, Japanese wholesalers. Tailormade suits from Hongkong, 123 dropship catalogs. Rockbottom prices. Free details. International Buyers, 216-M Jackson, Chicago 6, Illinois.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin PMW, Covina, Calif.

1963 FORDS $549.00, others below wholesale. Info. $1.00. Moulin, 920 Ferry, Tumwater, Wash.

BARGAINS! Buy wholesale! Save money! Free catalog!. Norris, 273-VO Merrick, Lynbrook, N.Y.

BUY Appliances, Cameras, Watches, etc. at factory prices plus 10%! Free details! Dam Company, 606-08 Bloomfield Ave., Verona, N.J. 07044.

NEW 6-Color deluxe below wholesale catalog. Automobile catalog and others. Housewares, clothing, furs, furniture, appliances, refrigerators, mixers, ironers, vacuum cleaners, polishers, cookware, dinnerware, strollers, cribs, radios, stereos, phonographs, portable electrical instruments, organs, typewriters, books, binoculars, luggage, sporting goods, bowling, golf, game tables, motor scooters, motor boats, motors, power mowers, chain saws, boats, motors, bicycles, clocks, watches, diamonds, jewelry. Huge discounts, hundreds name-brand items. For Free list (factory prices) postcard: Selbyco-5, Decatur, Illinois.

300 PAGE Wholesale catalog, $3.00 deposit. Glenn Slade's Texas Gun Clinic, 3450 Gulf Freeway, Houston, Texas.

FREE! 128 Page illustrated catalog. More than 2000 Name Brand Items; below wholesale prices. Sell full or part time. Save hundreds of dollars on purchases for yourself! Watches, jewelry, cameras, radios, phonographs, tape recorders, appliances, housewares, cookware, hardware, power tools, luggage, musical instruments, sporting goods, toys, many others. 8 floors of Name Brands. Orders shipped within 24 hours. Continuous supply. Send for free catalog now! H. B. Davis Corp., Dept. PM, 145 West 15th Street, New York, N.Y. 10011.

USED and new watches $2 up. Free list. Southern Watches, 5-PM So. Wabash, Chicago 3.

SPECIAL SERVICES

PROTECT Your eyes! Corrected curve, first quality. Case hardened lenses ground to your prescription by New York State licensed Opticians. Deal directly with optical laboratory established 25 years. Mail your prescription or prescription for nonable quote, also regular spectacles and magnifiers. Global Opticians, 16 East 23 Street, New York City.

INFORMATION On anything. Ferguson Research Specialists, 83-43 Vietor Ave., Elmhurst, N.Y.

ANY Shape non-prescription sunglass lens replaced, $1.75 per lens. Broken frames, hinges repaired, $1.85. Enclose payment order. Skinta, 5 Gladecka St., Blauvelt, N.Y.

FACTS, Any subject—product. Research, surveys, reports, assignments. Information 25¢. Box 1431, Greenville, South Carolina.

TELL The more than 1,350,000 avid readers of Popular Mechanics about your products and services. It costs very little to place your classified message in front of these proven mail order buyers. For further details, write: C. A. Martin, Dept. 47, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

EDUCATIONAL AND INSTRUCTION

BOOKKEEPERS. Operate your own "Dollar-A-Week" system. Ellis, Box 200, Cedar Grove, North Carolina.

PIANO Tuning pays. Big money in spare time. Learn at home. No musical knowledge necessary. Phonograph, records, tools, instructions furnished. Electronic tuning also taught. Free catalog. Capital Tuning School, 3160 S.W. 16th Court, Ft. Lauderdale, Fla.

MISSOURI Auction School. Free catalog! 1330-03 Linwood, Kansas City, Mo. 64109.

USED Courses! Books! List 10¢. Smith's, 124 Marlborough, Salem, Mass.

FCC License in 6 weeks. First class radio telephone. Results guaranteed. Elkins Radio School, 2603D Inwood, Dallas, Tex.

WOODWORKING and cabinetmaking course for beginning and advanced home craftsmen. Only complete low-cost home training program available. Write for free booklet. Interstate Training Service, Dept. G-3, Portland 12, Ore.

SWEDISH Massage and Physical culture pays big profits. Learn at home. Diploma. Free catalog. National Institute, Dept. E55, 307 North Michigan, Chicago 1.

AUTOSUGGESTION. Sleep-learning headquarters! Tapes, records, books. Gigantic catalog free. Research Association, Box 24-PM, Olympia, Washington.

MONEY BACK GUARANTEE—C.I.S.T. —The World Wide Institute of Home Study —34 global centres—260 courses—Engineering, Electronic, Academic and Commercial—send for your FREE 100 page copy of "Career Opportunities" today—No salesman will call. C.I.S.T., 628 Garden City Building, 263 Adelaide St. W., Toronto, Canada.

LEARN Technical metaphysics—The ancient masters method of healing. Easy to learn, inexpensive. For free details write to: Premier College of Technical Metaphysics, P.O. Box 95, Ucluelet, B.C., Canada.

PIANO Tuning quickly learned with home study course. Diploma granted. American Tuning School, Gilroy, Calif.

LEARN Civil and criminal investigation at home. Earn steady, good pay. State age. Institute Applied Science, 1920 Sunnyside, Dept. 165, Chicago 40, Illinois.

ATTEND The nation's finest. Write Galion Welding School, Galion, O.

MASTER Watchmaking at home. Free sample lesson. Chicago School, Dept. YR, Box River Grove, Illinois.

INVESTIGATORS Course. Credentials, diploma, information. Southwestern Institute Criminology, Box 201, Geronimo, Oklahoma.

SWEDISH Massage. Foot technique. Post graduate. Home study. Credential, Diploma. Dr. Swanson's Illinois Licensed School, 3809-PL Alta Vista, Chicago 13.

—

USED Correspondence courses and books: sold and rented. Money back guarantee. Catalog free. (Courses bought.) Lee Mountain, Pisgah, Alabama.

HIGH School diploma at home. Licensed teachers. Send age, highest grade completed for free detail. No salesman will call. Southern States Academy, Professional Bldg., Dept. 16, Decatur, Ga.

PENMANSHIP Corrector. Improve poor penmanship quickly. Details free. Ozmen, Box 665-34, St. Louis 88, Mo.

WIN The success, prestige and happiness you have been denying yourself. Details free. Write: Williams, 1545 Beatrice, Detroit, Michigan 48217.

PENMANSHIP Book. "Ornamental and Business Writing." Improve quickly, fascinating, artistic. Details free. T. Tevis, Chillicothe, Mo.

COMPLETE Your high school at home in spare time with 68-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. X-545, Drexel at 58th, Chicago 37, Illinois.

MEN Wanted. Earn $125 a week and up. Master a trade with a future. Learn auto diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn $125 a week and up. Write for free bulletin: Dept. 256, Auto Diesel College, Nashville 3, Tenn.

HOME Radio course only $14.95. Free literature. Edu-Kits, Department 623B, Hewlett, New York 11557.

—

OWN Collection agency. "Little Gold Mine!" Franklin Credit, Roanoke, Virginia.

HELP The war against crime. Send for free brochure on how you can become a member of the Auxiliary Police Association. Write PM—IAA Police Hall of Fame, Venice, Florida 33595.

FREE Catalog! Bargain books on self-help, careers, health, hobbies, etc. Write Aladdin, Box 5183-C, Oakland 5, Calif.

PROFITABLE National Camera Repair School training at home! PM5, Englewood, Colorado.

PERSPECTIVE Drawing. New exact method. Complete, illustrated, $1.10. Hason, 28 Mirabel, Mill Valley, Calif. 94943.

GET A British degree: Divinity, Philosophy, Radionics, etc. Free Prospectus free. Brantridge Forest School, USA Representative, Box 357, Lincoln, Montana.

SPEAK "Vacation Spanish." Learn real, living conversation—fast. Amazingly simple. Loads of fun. Complete course $1.95, refundable. Ray, Dept. E-1, 68 River Route, Kingman, Arizona.

LEARN To drive tractor, trailer, trucks, buses. Short intensive courses available. Write for free brochure. Driver Training Institute, 794 Bedford Ave., Brooklyn, N.Y. Ja 2-5080.

PASS Any civil service examination. Question, answer books with sample tests, free details. Research Products & Publications, Box 235, Brea, Calif.

LEARN Special investigation. 20 Lessons, credentials, diploma. Future International Academy of Police Science, Oklahoma City, Oklahoma.

USED Courses, books. Catalog, 10¢. Courses bought! Bayless, 78B Courtright, Wilkes-Barre, Penna. 18702.

EARN High Pay, Job Security and Career Advancement as a Licensed Aircraft Mechanic. Pittsburgh Institute of Aeronautics, the nation's largest specialized aviation mechanics school, offers courses leading to FAA licensing as airframe and powerplant specialists. Over 47,000 young men have attended this school and are now enjoying lucrative rewards working for airlines, aircraft manufacturers, and as corporation aviation mechanics. 92% of PIA's 1964 graduating class has already found placement in the field for which it trained. Housing Available—Financing Arranged—High School Diploma Required. For complete information write Pittsburgh Institute Of Aeronautics, Allegheny County Airport, Box 10897, Pittsburgh, Pa. 15236.

LEARN Aiken or awake! Records, tapes, equipment. Free catalog! Drawer PM-697, Ruidoso, New Mexico.

PLAYS, STORIES, MANUSCRIPTS

WANT Your book published? Learn how we publish, advertise, promote, distribute. Many successful. Free booklet. PM, Vantage, 120 West 31, New York City.

ADVERTISING AGENCIES, ADV. SERVICE, MAILING LISTS

FREE! Redbut book. "More Profit From Your Advertising" includes best mailorder magazines, newspapers. Adservice, 11730 NW 22E Court, Miami, Florida 33167.

MAILING Lists most all kinds 1000 $5.00. Free folder. Your circulars mailed $4.00 1000. Dixie Mailers, King, N.C.

OUR Clients' classified advertisements in magazines and newspapers have to pay and they do. If yours doesn't, contact Allan O. Powers Advertising, 116 John, New York 38.

ADVERTISING Ratebook leading newspapers, magazines, free. Chicago Advertising Agency, 38-E Jackson, Chicago 4.

MAILORDER Record Book. 30 pages. Records inquiries, orders, advertising expense, etc. Most complete. Just send dime for postage and handling. C. A. Martin, Popular Mechanics, 575 Lexington Ave., New York, N.Y. 10022.

TYPEWRITERS, DUPLICATORS, OFFICE DEVICES

OFFSET, Letterpresses, varityprs, typewriters, mimeograph, multigraph machines. Bargains. DixieGraph, King, North Carolina.

RUBBER STAMPS AND OFFICE SUPPLIES

THREE Lines $1.00. Cushion mounted indexed R. Creed, Upton, Mass. 01568.

POCKET 3 lines $1.00. Office stamps $1.50. Free catalog. Specialty, 8464 Manhattan, Detroit, Mich. 48211.

FREE Catalog: Rubber stamps, printing. Dowling Products, Dept. PM55, Pittstown, N.J.

FREE Catalog. Metal pocket case—3 lines $1.75 Scharer, Parkhill, Pa.

STAMPS, Business cards, stationery embossers. Every, Box 9233, Phoenix, Arizona 85020.

HARD Type for rubber stamp making and printing, free catalog. Barco Type, 221 S. Evergreen, Bensenville, Ill.

RUBBER Stamps, 3 lines, $1.00, additional lines, 25¢. Kling, 2800 Colley, Norfolk, Va.

3-LINE Pocket stamp and pad, $1.00. Catalog free. Carraher, North 64, Maple Park, Illinois 60151.

FREE 32 Page rubber stamp catalog. Signature stamps $3.50. Youngers Stamp Shop, Princeton, Iowa.

CARTOONING, COMMERCIAL ART, SHOWCARD & SIGN PAINTING, TATTOOING

LIKE To draw? Splendid opportunities in professional cartooning. Write for free catalogue. No obligation. National School of Cartooning, Studio-H, Box 8958, Cleveland 26, Ohio.

YOU Can entertain with chalk talks. Catalog 25¢. Balda the Cartoonist, Oshkosh, Wis.

SIGN Painting. Fascinating system. Stirsley, 410 South Western, Springfield, Ohio.

SIGN Painting. Instructions, brushes, equipment. Free catalogue. Kaufmann Supply, Centertown, Missouri.

SIGN Lettering tricks. $1.00. Harris, P.O. Box 1567-XE, Portland 7, Oregon.

LEARN Sign painting at home. Free talent test. Ben Kerns, Box 812-PM, Greenville, S.C.

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 95, Pleasant Hill, Ohio.

2 ART Lessons Free. Enjoy glamorous high pay career or profitable hobby. Study at home in spare time. Drawing, painting, advertising art, fashion illustration, TV art, etc. Assignments corrected with overlays by mail. Tuition $6.00 a month. Kits included. Free catalog. Special offer. No salesmen will call. Washington School of Art, Studio 145, Port Washington, N.Y. 11050. Accredited member national home study council.

FREE Cartoon lesson with criticism. Send $1.00 handling. Cartooning, Box 3176, Colorado Springs, Colorado.

MAKE Oodles of money in spare time! Be a portraitoonist! New uncrowded field. Write: J.R.M. Enterprises, Dept. 8, Box 3135, Euclid 17, Ohio.

—

LEARN Profitable magazine cartooning. Free details. Hartman, Box 3097, Lincoln 10, Nebraska.

PRINTING, MULTIGRAPHING MIMEOGRAPHING GUMMED LABELS

OFFSET Printing 500 8½x11 copies $3.50 postpaid. 48 hr. service. Cisco Duplicating Service, Atlanta, Illinois.

AMAZING Business printing values. Samples. Print Shop, Box 576, Greenville, R. I.

QUALITY Printing: lowest prices. Samples. Dowling Products, Dept. PM55, Pittsburgh, N. J.

LETTERHEAD Specialist. Samples. Community Press, Drive Circle Court, East Aurora, N.Y.

500 FOUR Line zip code address labels 50¢. Clayton, 509—21st Avenue, San Francisco, California 94122

FREE Booklet. "How to Save Money on Printing." Victor, 1366 North Western, Los Angeles 27, Calif.

250 8½x11 HAMMERMILL Letterheads, $2.75; 250 envelopes, $2.75 samples. Rubber stamps. Patton, Box 248T South Haven, Michigan.

$2.99 PER 1000, executive embossed business cards. Trial order. Free printing catalog. Weaver, Dept. 515, 3524 Northeast 118th, Portland, Oregon 97220.

PRINTING—8 Page Catalog—1½¢ Free Price List. Kopen, 286 Atlantic Avenue, Brooklyn 1, N.Y.

DISTINCTIVE. Embossed letterheads. Speedy postpaid service. Samples. Universal, 226-PE Myrtle, Scotch Plains, New Jersey.

FREE Samples, thermographed business cards. Rubber stamps, other printing! Griffin, 322 West State, Ithaca, New York 14850.

AMAZING Printing bargains, free details. ORGprint, 108 Walnut, Martins Ferry, Ohio.

TWO-Color letterheads, samples free. Clyde Williams, 6767 Plank Road, Charlotte, North Carolina.

100 TWO Colors porcelain finish business cards, $1.00. Eslick's Craft Studio, Delavan, Wis.

ORGANIZE Shop, identify shrubs, label personal items, with ¼" embossed self-sticking, waterproof tapes. Single line, white letters on black, red, gold. 16 words, $1.00. Double line 10¢ Labels, 86 Church St., Guilford, Conn. 06437.

MIMEOGRAPHING, Offset printing. Free samples. Pennway, Drawer 1340, Scranton, Penna.

1000 ADDRESS Labels, $1.00. Pocket rubber stamp, $1.00. Free brochure on imprinted items, labels. House of Robert's, 2700 Lynn Ave., Norfolk, Virginia 23509.

BUSINESS Printing. Catalog free. Bill's Press, 5539-P Leffingwell, Kirkwood, Missouri 63122.

PRINTING & RUBBER STAMP OUTFITS & SUPPLIES

MAKE Your own self-molding rubber stamps and printing cuts. Plexirubber. Argyle 1, Wisconsin.

TYPE And supplies for rubber stamp makers. New wholesale price list No. 3 free. Star Stamp Supply, 732 Federal, Chicago 5, Ill.

RUBBER Stamp presses, hydraulic operated, electrically heated. Size 5" x 8", 8" x 12", 10" x 15". Starting outfits, supplies. Printing presses. Type cases and cabinets. Custom Manufacturing, 1464-P East Commercial, Springfield, Missouri.

DO Your own printing. Save money. Simple rules. We supply everything. Print for others; good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-11, Meriden, Connecticut.

RUBBER Stamp presses, mounts, supplies. Martin, 1425S Major, Jefferson City, Missouri 65101.

NEW Type Catalog No. 11, 96 Pages. Send One Dollar. Deductible First Order. Acme Type, 732 Federal, Chicago, Illinois.

PRINTING Presses, type, supplies, lists 5¢. Turnbaugh Service, Mechanicsburg, Pa.

FOR INVENTORS

PROFESSIONAL Patent searches, $6.00, including official U.S. Patent Office copies of related U.S. patents! Prompt, dependable service. Certified, airmailed! For free "Invention Record Folio" and important information every inventor should have, write: United States Inventors Service Company, 1311 "G" Street NW, Washington 5, D.C.

SAVE High fees! Prepare your patent application yourself! New "Do-It-Yourself" patent kit now makes it easy! Free "Registration Form." Miss Blaine, 306A Carry Building, Washington 5, D.C.

PATENT Searches, including copies of related U.S. patents, $6.00. Inventors, attorneys, manufacturers use my "world-wide" airmail service! "Invention Record" form and "Information for Inventor Needs," sent free! Miss Hayward, 1029P Vermont, Washington 5, D.C.

INVENTORS: Save time and money. Prepare and file your own patent application. Our complete "Patent Kit" makes it easy. Includes detailed instructions and all necessary materials for $14.75. Money back guarantee. Don't delay. Send check or money-order today to National Inventors Service, 1244—19th Street, N.W., Washington, D.C.

PATENT Searches—48 hour airmail service, $6.00, including nearest patent copies. More than 200 registered patent attorneys have used my service. For free invention protection form, write Miss Ann Hastings, P.O. Box 176, Washington 4, D.C.

U.S. Patent Office Searches, 234 Broadway, Room 3615, New York. Free invention certificates.

TREMENDOUS—Savings! Prepare your patent application easily, easily, with our New "Patent Kit." Complete instructions, materials, sample application—send $4.95 for immediate delivery. Money-back guarantee! Congress Invention Company, 210 McKim Building, Washington 5, D.C.

INVENTORS: Your ideas and inventions (patented, unpatented) expertly searched and developed for commercial appeal and cash royalty sales to manufacturers by professional inventor developer with excellent record of experience. B.S., Industrial Engineering; U.S. Patent Office former Patent Examiner; U.S. Government former Patent Adviser. Second decade of reliable service! Free "Invention Record" and Important Information. Airmailed! Write Raymond Lasser, Licensed Developer, 1606N Bush Bldg., New York City 36.

PATENT And invention development, by licensed professional patent engineer and U. S. Patent Office former examiner, and engineering specialists. Your inventions and ideas engineered for patent protection and commercial value. Inventions developed by us negotiated for cash or royalties by our nationwide contacts. Send for free protection "Invention Certificates" and further interesting, valuable patent information. George Spector, Licensed Professional Patent Engineer, Woolworth Building, New York.

INVENTORS—If you have an invention for patented or unpatented, write for free brochure outlining manufacturer's requirements. Royal Kessler Corporation, C-55-Fl, Fremont, Ohio.

AMAZING Manual; how to protect, sell and finance inventions. Excellent results. Galleon, P.O. Box 409, Back Bay, Boston, Mass. 02117.

OFFICIAL Patent office drafting, $18 per sheet. Drafting, 77 Surrey Lane, Hempstead, N.Y.

BETTER Patent services: profit from patents with good sales values and effective market protection by patent. I help inventors to have both at low definite fees: free self protecting forms give you security in disclosure; patents filed for $200.00 up; foreign patents filed at very low cost. Forty years successful practice. Joseph O'Brien, Patent & Development Engineer, R 1127, Munsey Building, opposite U. S. Patent Office, Washington, D.C. Patent searches made for $7.50, with references.

INVENTIONS WANTED

FEDERAL Trust Company, 4344 East Indian School Road, Phoenix, Arizona 85018.

INVENTIONS Wanted. Patented: unpatented. Tremendous manufacturers lists. Globe Marketing Service, 2420G 77th, Oakland 5, California.

INVENTORS Wanted: Manufacturers need new items! Your inventions, ideas developed for cash/royalty sales. Free "Invention Record": Information. Raymond Lee, 1606P Bush Building, New York City 36.

EIGHT Inventors sold their inventions last month. How about us selling yours? Turn your inventions into cash! Remember we sell your invention or pay you cash bonus. Write for details of our guarantee. Universal Inventions 44, Marion, Ohio.

INVENTIONS Needed immediately for manufacturers. For additional information write Kessler Corporation, C-55-1W, Fremont, Ohio.

CHICAGOLAND Patents needed. All kinds. Special connections in medical industry. No fees. Inventors Research and Marketing Corporation, Box 284, St. Charles, Illinois.

MANUFACTURING

MODELS — Small lot manufacturing. Metals, plastics, etc. Milburn, Burlington, Kentucky.

CASTINGS, Aluminum, bronze, send pattern or drawing for free estimate. Lehnert Company, Blairstown, New Jersey.

INVENTORS Service. Model building. Research. Manufacturing. Top consultants in all fields available. William Parker, 32 Westminster, Worcester, Mass. 01605.

WIRE Forming progressive dies, send print, part sketch, short run turning. B. L. Tool & Die, 413 26th St., Union City, N.J. B. Lindberg, prop.

MODELS—SHIPS, TRAINS, PLANES, ETC.

SHIP and yacht model fittings: Pine construction hull kits; blueprints. Send 50¢ for illustrated catalog. A. J. Fisher, Inc., 1002 Dorwah Avenue, Royal Oak, Michigan. 48067

SHIP Models, Kits, fittings, plans, books, tools, engines, motors. Big illustrated catalog 50¢. James Bliss & Co., Dept. SM, 342 Atlantic Avenue, Boston 10, Massachusetts.

TRAIN Bargains: 25¢ brings catalogue of 2000 Gilbert, Lionel, Atlas, etc. Bargains—all gauges. Also Strombecker, Aurora, Revell and other plane, car, parts. Hobby Surplus, P.O. Box 1106M, New Britain, Conn.

ROCKETS: New illustrated catalog 25¢. Single and multistage kits, cones, engines, launchers, trackers, technical information, etc. Fast service. Estes Industries, Penrose 2, Colorado.

SHIP Model kits and fittings: clippers, frigates, etc. Catalog paint-tool list, book list, 35¢. Model Shipways, Box 83, Bogota, N. J.

HOME CRAFTSMEN

2512 PLANS. Patterns, things to make, do. Fun. Profit. World's greatest selection. New catalog 10c. Craftplans, 18250-A Harwood, Homewood, Ill.

101 PATTERNS Of smart gifts, novelties, shelves, action windmills plus "Make Money Jig Sawing." $1.00. Mastercraft, 55M, 7041 Olcott, Chicago 31.

FREE "Do-it-yourself" Leathercraft catalog. Tandy Leather Company, Box 791E33, Fort Worth, Texas.

FREE! Big 80 page Leathercraft catalog, 100's of new items! MacPherson Bros., Dept. K 730 Mission St., San Francisco, Calif. 94103.

KNOCKDOWN Cedar chests, also over fifty kits. Catalog 25c. Giles Kendall Co., Huntsville 2, Alabama.

PLANS, Bird houses and feeders. Illustrated catalog, 25c coin. F. Yeager, 1665 Linden, Homewood, Illinois, 60430.

SKIL-CRAFTS New '64-65 catalog. Largest and finest selection of leathercraft, artist, hobbycraft supplies in the world. Free gift with first order. Send 50c. Refundable with first order. Skil-Crafts, Box 105-P, Joplin, Missouri.

WOODWORKERS: Shop-built dovetail machine makes dado joints obsolete. Plans, $2.00. Jenks Craft Shop, Bolivar, Mo.

CYPRESS Knees, for making lamp bases, flower arrangements. 6 inch, $1.00; 12 inch, $1.75; 24 inch, $2.50. Jaytee Enterprises, Box 384, Alexandria, Louisiana.

WALNUT, Cherry, silver maple, gun stocks, square lumber, picture frame moulding. Midland Lumber Company, Box 262, Savannah, Missouri.

PLANS For pool table with extra two-face top for table tennis and model railroad. Blueprints B1209 and building instructions $3.50. Popular Mechanics Service Bureau, 575-M Lexington Ave., New York, N.Y. 10022.

YOUR Ad in this space will be read by more than 1,350,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 60, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

DO IT YOURSELF

DELICIOUS Barbecue without flames, soot, or dangerous hydrocarbons. Plans, $1.00. Stanton Designs, Box 1664-PM, Highland, Indiana.

FLUORESCENT Tubes rejuvenated at no cost. Instructions $1.00. Rejuvenators, 172 Bolton St., Portland, Me.

EXERCISE At home on build-it-yourself physical fitness equipment, including bicycle exerciser, towing machine, belt massager, and abdominal exerciser. Send $2.50 for blueprints B1208 and instructions. Popular Mechanics Service Bureau, 575-E Lexington Ave., New York, N.Y. 10022.

GROW Trees of beauty. Seeds of fir, cedar, pine, and 7 others, identified, $1.00. Century, P.O. Box 94, Belmont, Calif.

HOME Bars. Four exciting models. Easy kits. $29.95 up. Factory direct. Including Bar-ture, Bild-A-Bar, Box 8155B, La Sierra, California.

CONCRETE Block homes, cottages. Build yourself low as $1,000. Free plans catalog plus "How To Build" Bailey Builders, 7213 Missouri, Little Rock, Arkansas.

CONCRETE Sets in hour! For harder, denser, waterproof concrete, substitute quart of Insuro Concrete Intensifier for one quart of the water normally used with bag of cement. Permits working in cold weather, too. Ideal for basements, driveways, repairs. Market Dept. Insuro, Industrial Imports, 1112 N. Ontare Rd., Santa Barbara, Calif.

GIANT Soldering kit offer! Includes soldering iron, set of pliers, resistors, printed circuit board, instruction manual and free guidance by mail! $14.95 Complete. Soldering instruction manual alone: $1.00. Micro-Kits Co., Dept. PMC, Box 494, Paramount, California 90724.

FREE Check-list covering more than 300 classifications of projects, plans, instructions, service and repair information detailed in Popular Mechanics famous series of instructional books, patterns, and blueprints. List covers an extremely wide variety of do-it-yourself data on home remodeling, repair and improvement, hobbies, crafts, boating, games, lawn and garden, and hundreds of others. For your free copy of this helpful list, write: Service Bureau, Popular Mechanics, 575 Lexington Ave., New York 22, New York.

WATCHES, OLD GOLD, JEWELRY

WANTED, Gold, silver, platinum, scrap any condition. Information Free. Wilmot's, 1067D Bridge St., Grand Rapids 4, Michigan.

WATCH And clock repairing books. Free catalog. Horological American, Box 77-AE, Fox River Grove, Illinois.

WATCHES. Men's shockproof, women's dresswatch both 17 jewels gold or chrome, also skin diving automatic, full price, $9.95 each. Quantity prices. International Imports, 1310 Mesa, Fresno, California.

HIGHEST Cash for gold, teeth, jewelry, rings, diamonds, watches, silver platinum. Mail articles today. Free gift with information. Chicago Gold & Precious Metals, 5 E. Monroe, Dept. 1958, Chicago 3.

WATCHMAKERS Tools, materials, supplies. Wholesale Catalog. Gales, Box 1000, Chicago 90, Ill.

USED Timex wrist watches, as is, 5 for $5.00. Joseph Bros., 5 South Wabash, Chicago 3.

WATCHMAKERS'-Jewelers' supplies, instructions. Clock Shop, Bengal's, 10717 Venice, Los Angeles 34, California.

CASH Immediately for old gold, jewelry, gold teeth, watches, diamonds, silverware, spectacles, platinum, mercury. Free information. Home Industries, 29-A East Madison, Chicago 2.

TOBACCO

CIGARETTES 12¢ package postpaid. Information—50¢. Box 19, Waverly, Mass.

PIPE SMOKERS, amazing Cur-A-Pipe. New break in appliance mellows and cakes up that new pipe in no time. No more harsh break-in period. Results guaranteed. Only $1.00. Pipes, Box 125, St. Ann, Mo. 63074.

OF INTEREST TO WOMEN

WOMEN! Make big money at home. $10.00 profit in an hour possible with invisible mending. Make holes, tears disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details free. Fabricon, 1533 Howard, Chicago 26, Illinois.

STRAIN—Rectal strain relieving device. (External). Dr. Charles Hudson, 680-B Dwr., Easton, Pennsylvania 18043.

DOLLS! Dolls! Dolls! We teach you to make, repair, dress and sell. Study at home. Barn village, Pennsylvania. Free booklet. Doll Hospital School, Studio MC-55A, 1826 San Vicente Blvd., Los Angeles 49, Calif.

UNUSUAL Artistic stationary — real feathers, leaves. $10.00. Rose Ruland, 4320 E. McDowell, #16, Phoenix, Ariz.

NYLON LACE 40 yards $1.00. Buttons 89¢ —$1.00. Schaefer, Box 336, Champlain, N.Y.

AMERICAN Family cookbook, new edition, 832 pages, hardback, $1.95. Rau & Rau Distributors, Box 5016, Detroit, Michigan 48235.

FREE Recipe. World's best fried chicken. Recipes, Box 7149, Oakland, California 94601.

TREASURE FINDERS

TREASURE Hunters, prospectors, beachcombers; pin-point exact location buried coins, relics, gold, silver with powerful metal locators. Free literature. Write: Goldak, Dept. B-5, 1544 W. Glenoaks, Glendale, California 91201.

TREASURE, Gold, silver relics. Find them with new 1965 models. Free information. Rayscope, Box 715, North Hollywood, California.

TREASURE, Find gold, silver, relics with super powerful Detectron locators. Free information. Detectron, Dept. 5-PM, P.O. Box 243, San Gabriel, California.

METAL Locator kits and assembled models from $39.90. Terms. Transistorized models available. Free catalog. Electronic Applications, Dept. M, Box 6095, Alexandria, Virginia.

SAVE! Build transistorized treasure finder. Details free. Research, Box 347-B, Alden Manor, Elmont, N.Y.

NEW, Coin locator! Free literature! Howe, 811-C Kansas, Atchison, Kansas.

POWERFUL Metrotech locators detect gold, silver, coins, relics. Moneyback guarantee, terms. Free information. Underground Explorations, Dept. A, Box 793, Menlo Park, California.

FIND Lost or hidden treasures with new transistor metal detector, underwater metal detectors, scintillation counters, etc. Free literature. Gardiner Electronics, Dept. 9, 4729 North 7th Ave., Phoenix, Arizona.

AMAZING Profits buying, selling scrap gold. Complete instructions, $2.00. Information free. Lincoln, Box 52, Hempstead, New York 11551.

GOLD, Treasure, coin locator $2.00 complete. Guaranteed. Treasures, Ashland, Oregon.

TREASURE Metal detectors most complete line in U.S.A. Free catalog. Bill's Service Center, Box 1, Paramount, California.

EXCITING Adventure locating hidden loot, treasure, relics, etc., with powerful, electronic M-scope locator. Lightweight. Guaranteed. Very easy terms. Send for free booklet, interesting customer reports. Fisher Research, Dept. AY, Palo Alto, Calif.

TREASURE. Descriptive 22 page booklet of lost, buried and sunken treasure maps which are available from official and commercial sources. Only 21.00. U.S. Publishing Corp., Stuart, Florida.

TREASURE—Fone Automatic A new principle in electronic metal detection. Write: Highlander Co., Dept. 23, 10308 Brenda Way, Rancho Cordova, California.

TREASURE Metal detectors most complete line in U.S.A. Free catalog. Bill's Service Center, Box 1, Paramount, California.

GOLD And silver indicator, $15.00. Literature free. Geo. Simpson, 18788 Cajon Blvd., San Bernardino, Calif.

DETECTOR Buyers—get owners reports first. Using, testing service new models. Genuine data; send only $3.00. Honest Ed's Electronics, Detector Enthusiast, 3709 Funnin, Houston, Tex.

NEW Supersensitive transistor models detect buried gold, silver, coins. Kits, assembled models. $19.95 up. Underwater models available. Free catalog. Relco-A40, Box 10563, Houston 18, Texas.

REMAILING SERVICE

HAWAII Secret unadvertised address. Remails 25¢. Receiving-forwarding $3.00 monthly. Postcards. Souvenirs. Coe, Box 984, Kailua, Hawaii 96734.

SECRET Receiving and remailing. Discreet and confidential. Remail 25¢ single. 9050 S. Main, Houston, Texas.

PADUCAH Remailing 25¢. $3.00 monthly. James Prince, Route 7, Paducah, Kentucky 42002.

LAS Vegas, Nevada. Free details. Box 5027S, Airport 89111. Low as 1¢.

MIAMI Remails 20¢. Monthly rates. Marie, Box 1266, Coral Gables, Florida.

LOS ANGELES. Hollywood, San Fernando Valley—25¢ single; $3.00 monthly. Confidential, 10437 Lanark Street P, Sun Valley, California 91352.

CONFIDENTIAL Mail receiving-forwarding service. Box 84 Chestnut, Saugus, Massachusetts 01906.

HAWAII Re-airmail, hotel stationery souvenirs, confidential. Single, 25¢ monthly, $3.00. Jack G., P.O. Box 1897, Honolulu 13, Hawaii.

SECRET Mail receiving system. Hedgeth, 406-M South Second, Alhambra, California 91802.

NATIONS Capitol. Confidential remails 25¢. Monthly $3.00. Rite-Way, Box 4496, Washington, D.C. 20017.

ITALY. Panoramic postcards with greetings, birthday cards, with your name in special print, air-mailed from Capri, Florence, Milan, Naples, Pisa, Rome, Vatican, Venice, $1.30 single. In ordering specify city, print your name, addresses's. Reairmails $1.30. Money Orders only. Capodilupo, Monte Sacro, Rome, Italy.

CONFIDENTIAL Remails, 25¢. Monthly $3.00. P.O. Box 5036, Fresno, Calif.

SAN FRANCISCO unadvertised mailing address. Remails 25¢. Receiving-forwarding $3.00 monthly. Postcards. Souvenirs. Prompt service. Golden Gate Mails, 1128 Seville Dr., Pacifica, California.

TEXAS Remails, 25¢, monthly $3.00. 6857 Routt St., Fort Worth, Texas 76112.

PROMINENT Hollywood blvd. mailing address and remailing. $3.00 monthly. Dennis Enterprises, 6663 Hollywood Blvd., Hollywood, California.

QUEBEC City 4, Canada, Box 567, 25¢, $3.00. Dime brings interesting literature.

NORFOLK, Virginia remails 25¢, monthly $3.00. Kling, 2800 Colley, Norfolk, Virginia.

GATEWAY Remailing, 25¢ single, $3.00 monthly. G.S., Box 6904, St. Louis, Missouri 63123.

PRIVATE Address, personal-business. Information 25¢. Remails 25¢, advise city: Baltimore, Richmond, Charlotte, Atlanta, Jacksonville, Tampa, Dallas, Horton, 68 Kensington Greenville, South Carolina 29609.

CONFIDENTIAL New York City mail address $3.00 month. Remails 25¢. Details free. Birnhan, 152 W. 42, New York City 36.

PERSONAL

BORROW $100 to $1000 by mail. Quick, easy, private. No co-signers. Repay in 30 small monthly payments. For the amount you want write today to Dial Finance Co., 410 Kilpatrick Bldg., Dept. 5-001, Omaha, Nebraska 68102.

INVESTIGATORS. Free brochure, latest subminiature electronic surveillance equipment. Ace Electronics, 11500-P NW 7th Ave., Miami 50, Florida.

ONLY $44.00 monthly repays $1008.46 (thirty payments). Borrow $100-$1000 entirely by airmail. Write today. Bankers Investment Company, 67-A, Hutchinson, Kansas 67501.

OCCULT Supplies and services, catalogue free. Lodge Branirdge Forest, Balcombe, Sussex, England.

RUPTURED. Relief and comfort. No understraps, elastic or steel. Write Hand-Lock Products, Preston 4, Ont., Canada.

BORROW $1,233 Airmail! Repay $54 for twenty-nine months. State licensed. Postal Finance, Dept. 17-K, Kansas City, Kansas 66117.

DEEPLY In Dept? Clear credit—Quick relief write Advisor, Box 48337PM-2, Los Angeles 90048.

BIBLE Questions answered. Stamped envelope. Bylon, 17167 Bentler, Detroit, Michigan 48219.

WORRIED About debts? Get immediate relief. No loans, no borrowing. Eliminate worry, pressure, collectors. Stop suits. Protect family, home, salary, possessions. Thousands helped by provision to protect wage earner. Avoid ruin. Obtain audigence facts, send $2.00. Aids, Box 2444, Miami Beach, Florida 33140.

SUBCONSCIOUS Conditioning remakes personality while you sleep. Free details. Sleep-Learning, Box 24N, Olympia, Washington.

TRIM That waistline with help of great new heat belt! Free information. House of Health, 310 E. 3rd St., Dayton, Ohio.

RADIOACTIVE Fallout worry you? Eight Russian chemical antidotes, $5.00. Might save your life. Dr. Arthur Dunn, 5101 Rees Street, Omaha, Nebraska 68106.

AMAZING Personal defense spray routs animals, assailants. 20 shot jet dispenser, $1.00. Edco, 37 Elmer, Buffalo, N.Y. 14215.

BACKACHE: Exercises to strengthen weak back muscles, which cause many back problems. Only $1.00. Sacex, Box 203, Niles, Ill.

HOW To wipe out all debts. Clear credit. Free details. Counselor Reports, Box 2206, Harlingen 1, Texas.

HOME I. Q. test. Know your I. Q. Free information. Test Center, Box 139, Fresh Meadows 65, New York.

LAST Will and testament. Have you made your last will and testament? Free postpaid. The Glenn Co., Greenfield, Indiana.

FORGET Birthdays, important events? We remind you. 25¢ Each date. Stephens, 1478 Joliet, West Chicago, Illinois 60185.

NEED Money? Borrow $100-$1000 by mail. Confidential, repay in 24 months. Free loan application. Budget Finance Co., Dept. HB-125, 317 So. 20th, Omaha 2, Nebraska.

LOANS By mail, $100-$1000. Anywhere. Confidential. Free details. Finance, Dept. PM, 222 W. Osborne, P.O. Box 7457, Phoenix, Arizona.

WANTED—MISCELLANEOUS

STAMP Collections, accumulations. Eagle Stamp Co., 2221 Romine, Pittsburgh 26, Penna.

INDIANHEAD Cents, any amount. Immediate payment. 10¢ each. Yntema, Jamestown, Michigan.

BUCK Rogers casting molds, toys, comics. Pete Zarilla, 600 Virginia, Rochester, Penna. 15074.

FOR SALE, MISCELLANEOUS

HEARING Aid batteries wholesale. Free list. Hahs, Box 51, York, Penna.

ORIGINAL Paintings by T. J. Anderson. Information, $1.00. Box 15, Wytheville, Virginia.

EPOXY Miracle glue, save 60%. Epoxy, Box 10104, Elmwood, Conn.

PORTABLE Refrigerator 16 pounds. Battery operated in car or boat or 110 Volts AC house current. Office, school, trailer, spare for boat. Tremendous savings. Free details. Sheirr Electronics Lab., 1422 Tamarind Ave., Los Angeles, California 90028.

AUTOMATIC Rifler computer. Dial hip, common, jack lengths instantly. Free literature. $4.95 postpaid. Satisfaction guaranteed. Ermbert, Box 221, Sycamore, Illinois 60178.

MISCELLANEOUS

SEND Us wool for blankets. Free Literature. El Dorado Woolens, Eldorado, Texas.

BIRTH Certificates, Marriage Certificates, Diplomas! 2 blank forms $1.00. Same 10 for Standard Forms, Box 7228-M, Washington 4, D.C.

FREE Wholesale catalog! 100,000 products. Tremendous discounts! Taylor Distributors, Newton 2, New Jersey.

YOUR Name sent to 1000 importers, publishers, mailers, wholesalers, etc. on our mailing list. Year $1.00. Dixie Mailers, King, N. Car.

CIGARETTES—Make 20 plain or filter-tip for 9¢. Factory-fresh tube tobaccos. Mild tropical flavored Philippine cigars. Free free. Moberly, Box 903, Owensboro, Kentucky.

BOOKS On antiques and their prices. Free circular! P. Warman Publishers, Uniontown, Penna.

RECEIVE Magazines, catalogs, folders, mail order money-making opportunities. Year $1.00. Marvin Green, Box 26983, Los Angeles 26, California.

CESSPOOLS. Septic tanks restored to new condition by miracle crystal pellets. Free literature. Electric Sewer Cleaning Co., Allston 34, Mass.

HAVE FUN, sports car horse racing game; treasure game; tag; ringalario game; $1.00 for all. Gay Games, Box 117, Union City, New Jersey 07087.

SAVE To 90%! Books, all subjects, paperbacks and clothbound. Dime brings catalogues. Hallows, 14 Drexel, Cahokia, Illinois 62201.

AMAZING! This month's secret gifts. Swedish handicrafts. Only $1.00 or $3.75. WMK Box 4042, Trollhättan, Sweden.

RIDE a powered yogo stick! Novel fun for kids from eight to eighty. Safe! No effort required! $4.95. Free details. PoGo-Mo, Box 31, Churchville, N.Y.

STOP Bill collectors—Immediate action —free details; Advisor, Box 48337-A, Los Angeles 90048.

ORNAMENTAL Iron designs. Book of 1600 beautiful, practical designs for railings, columns, etc. Free literature. Cunningham, 3881 South 3200 West, Salt Lake City, Utah 84119.

FREE Songs. Beautiful sheet music sent as promotion free, effort. Absolutely free. How many? Nordyke Music, 6000-19 Sunset, Hollywood, California 90028.

INSTALL Your own central vacuum. We have everything. Details $1.00. Wanda Mfg. Co., Comanche, Okla.

FREE, 500 things. Write different manufacturer. List $1.00. Sam, Box 807, Clarksville, Tennessee.

BLITZ Reducing! 5 pounds overnight! Guaranteed! Bijou, Box 1727-BM, Hollywood, California 90028.

SYNTHETIC Gems. Gold, silver settings. Free literature. Custer, Box 5712, Detroit 39, Michigan.

FREE Details on new kind of innersole for easier walking. Lobel, Suite 350, 130 West 42nd Street, New York 36, N. Y.

MAPS—United States, airman's foreign; Civil War campaigns; all $1.00. Research, Box 788, Washington, D.C.

SELF-Help ideas, guaranteed. Free details. Reddys, 713 East First, Auburn, Indiana.

LOANS By mail, $100-$1000. Anywhere. Confidential. Write Union Finance, Dept. PM, 222 W. Osborne, P.O. Box 7457, Phoenix, Arizona.

AUTOMATIC Rifler computer. Dial hip, common, jack lengths instantly. Free literature. $4.95 postpaid. Satisfaction guaranteed. Ermbert, Box 221, Sycamore, Illinois 60178.

Want active selling and high earnings?

Read about aluminum roof coating —and a great expanding market! Then mail the coupon.

Quality aluminum roof coatings offer top sales careers for the right men—high earnings to start, increasing income year after year.

Here's why: Maintenance experts say aluminum roof coatings are among the most highly regarded roof-maintenance products for sale today.

The market is there. In every county in the country—on factories, mills, warehouses, farm estates, grain elevators, schools and public buildings—thousands of acres of roof surface need restoring and preserving now.

There's no big investment, no tedious training. Many men take off with little previous sales experience, become experts, and double their incomes the first year.

You *do* have to like outdoor activity, meeting people and making friends. You should be the type of man with a good reputation who wants stability and growth. It's a big "repeat" business.

More about the product? Good aluminum roof coatings combine pure Alcoa® Pigments in a tough asphalt base. When applied, the aluminum flakes "leaf" to form a metallic shield that protects the vital oils from the sun; keeps the coating pliant and waterproof; and prolongs roof life.

Reflective aluminum effectively reduces under-roof temperatures in hot weather. This means better working conditions and reduced operating costs. Bright appearance lasts for years. Why not join this expanding segment of the protective coatings industry? It could be the sales opportunity of a lifetime.

Alcoa does not make or sell aluminum coatings, but we are anxious that you have more information about them. Write today or mail coupon.

Alcoa Brings You America's Finest News Show... THE HUNTLEY-BRINKLEY REPORT, on NBC-TV

ALCOA

Aluminum Company of America
895-E Alcoa Building, Pittsburgh, Pa. 15219

Yes, I'm interested in selling aluminum roof coating. Please send more information and descriptive literature.

Name_____

Address_____

City_____

State_____ Code_____

A water glass helped make the new Mercs 50% quieter

Did you ever tap on an empty water glass; then a full one? Remember the difference? The full one isn't as loud because the water damped-out vibration. This simple principle of sound helps make the new 4- and 6-cylinder Mercs 50% quieter.

Mercury uses engine cooling water as the damper. It surrounds Mercury's new internal exhaust pipe. This "wall-of-water" prevents exhaust and mechanical noises from passing through the walls of the drive shaft housing. Unlike ordinary outboards, which pay for noise reduction by *sacrificing* power, Mercury's new silencing system actually *boosts* power to the prop.

Mercury also designed a new suspension that "floats" the engine cowling on large, soft-rubber mounts. This prevents the normal working noises of the powerhead from being "picked-up and broadcast" by the cowling surface. To make sure that sound remains trapped inside, the cowling was made "sound-tight" by rubber-sealing all openings for controls and fuel lines.

Dyna-Float, aircraft-type suspension and mechanical isolation of the remote steering control arm completed the sound engineering program that made the new Mercs 50% quieter. Drop by your Mercury outboard dealer's and hear them yourself. Let him show you why you get less noise and more RUN for your money with Mercury . . . 100, 90, 65, 50, 35, 20, 9.8, 6 and 3.9 hp.

MERCURY

©1965, Kiekhaefer Corporation, Fond du Lac, Wisconsin, and Toronto. Subsidiary of Brunswick Corporation.

Get the smoothness of *two* front axles and a Six that feels like an Eight

You'll have to ride in this new Ford to believe that *any* pickup can ride so well.

For only Ford has *two* front axles. They work independently so that jolts at one wheel are never transmitted to the other. The front end doesn't "mush out" on curves. Doesn't dive when you brake.

On the road—or in the rough—you'll find Ford's Twin-I-Beam ride far smoother. And Ford's engines are smoother, too. Big, new seven-main-bearing Sixes feel as smooth as an Eight. A new 352-cu. in. V-8 is most powerful in Ford pickup history... economical, too. See your Ford dealer!

RIDE WALT DISNEY'S MAGIC SKYWAY AT THE FORD MOTOR COMPANY PAVILION, NEW YORK WORLD'S FAIR

'65 FORD

TWIN I BEAM
INDEPENDENT SUSPENSION

PICKUPS

BUILT TO LAST LONGER

Reason for Ford's smooth ride is exclusive new front suspension with *two* front axles. Each works independently so that shocks at one wheel are not transmitted to the other. Axles are forged I-beams as used in big-truck axles. Result: big-truck durability with car-like ride.

PRODUCTS OF Ford MOTOR COMPANY

PHOTOGRAPH TAKEN JANUARY, 1965.

DUTCH BOY IS A REGISTERED TRADEMARK OF NATIONAL LEAD COMPANY.

Since 1950, Joseph B. David's home has only been repainted once. The paint: Dutch Boy House Paint. The reason: More years to the gallon.

The Joseph B. David home in New Orleans, Louisiana, was first painted with Dutch Boy House Paint in 1950. During the next 14 years, it was repainted only once, in 1958, to keep it bright and weathertight through Southern sunshine and New Orleans humidity. Dutch Boy House Paint (made with linseed oil) will last and last, whatever climate your house is in. Your Dutch Boy dealer is listed in the Yellow Pages. Call him today for Dutch Boy House Paint. Or, if you live in a house as big as the Joseph B. David house, be sure your painter uses Dutch Boy. The paint with more years to the gallon.

Dutch Boy Paints. More years to the gallon.

When your GM car needs a part this precise . . .

insist on a part precisely like it.

A genuine General Motors replacement part.

For a GM replacement part is exactly like an original part. The way it looks. The way it works.

And when it comes to a job as critical as the carburetor in your GM car—nothing works quite like the needle and seat specially designed for it by GM engineers.

It's the same whether it's a tiny needle or a chuckhole absorbing spring: the surest way to get your GM car running just like new is with parts just like new—genuine GM parts.

So at tune-up time, or any time your car or truck needs servicing, treat it to the kind of parts it's used to. Look and ask for genuine GM parts in bright new GM and United Delco packaging in garages and service areas everywhere.

GENUINE GENERAL MOTORS PARTS

GM CHEVROLET · PONTIAC · OLDSMOBILE · BUICK · CADILLAC · GMC TRUCKS United Delco

Big mowing...5 or 6 acres?

IH Cub Lo-Boy® will whisk through it in half a day

Got too much work for 6 to 10 hp home tractors? Not enough for full-size farm or industrial units? International Cub® and Cub Lo-Boy® tractors should be an exact fit. They're both 13.4 hp—*only* tractors on the market of this "middle-weight" size. Capacity? This 5-foot rotary mower will fine-trim up to 15 acres a day!

Other attachments can keep your Cub working year-round. This front-mounted blade, for instance. Grade. Level. Backfill. Spread bulk material. Clear snow and debris.

More power in a Cub than you need? Can't be sure? Schedule comparison tests with a 7 or 10 hp Cub Cadet® through your IH dealer. For his name, phone Western Union by number and ask for Operator 25. International Harvester Company, Chicago, Illinois 60601.

You may prefer a cutter bar mower if you have steep banks and slopes. This IH 105 mower cuts a 5-foot swath at any angle from straight up to 45 degrees below ground level.

International Harvester—the people who bring you the machines that work

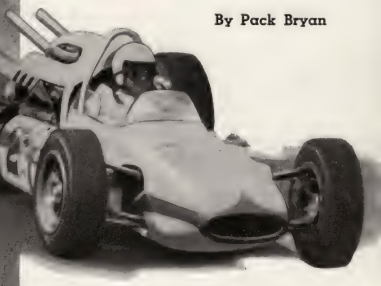
D

WHO'LL WIN at INDY?

'500' champs Foyt, Ward, Jones discuss this year's strategy, assess new car designs and rules, and speculate on the '65 winner

By Pack Bryan

A. J. FOYT, in an Offy roadster, prepares to lap Rodger Ward in last year's 500. Foyt went on to win with a record 147.350-mph average. Ward, in a rear-Ford-engined car, was second



THREE YEARS AGO they called them "funny cars." These were the light rear-engined racers entered by people such as Mickey Thompson, Jim Kimberly and Jack Zink.

Lotus-Ford had yet to be heard from. The heavy old roadster with the aging, front-mounted Offenhauser was still king.

Since then, Rodger Ward, Parnelli Jones and A. J. Foyt have each won the Indianapolis 500—still with old-fashioned roadsters. Yet the excitement since '62 has centered around rear-engined cars powered by special Ford V8s. In fact, these cars are the odds-on favorites for this year's 500.

Ward, Jones and Foyt had new rear-

engined cars last year. Each had his trusty roadster on hand, too. Ward switched to the rear-engined car and finished second. Foyt stayed with his roadster and won. Jones in his roadster dueled with Foyt for the lead, then dropped out after a fire during his first pit stop.

So why are roadsters now losing favor? Is Indy headed for another rut, this one "Powered by Ford?" *PM* went to the big winners, Ward, Jones and Foyt, to find out. They gave us some surprising answers in a taped interview.

Ward, with the best Indy record of any driver running—two firsts, two seconds, a third and a fourth in the last six races—said: "The rear-engined car is here to stay. I saw Jack Brabham's tests in October 1960 with a Cooper Climax and became convinced that this is the way we'd all have to go eventually.

"In '61 we had coil springs all around and were planning independent suspension for the following year. Logically, the next step would have been rear-engine independent suspension. But the car we had in '61 wasn't too successful (not that I'm complaining about third place). The following year our car owner insisted we go back to solid-axle, torsion-bar roadster construction. We won, but it still was a step backwards."

Still a Place for Roadsters

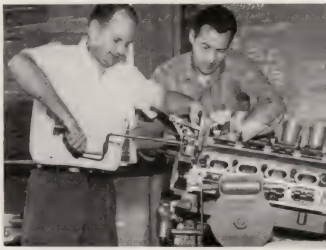
"I'd like to see a roadster with the horsepower we have in the rear-engined cars," said Foyt, another two-time Indy winner and four-time USAC national champion. "Front-engined cars aren't dead. If we'd had time this year, we'd have tried the Ford engine in my roadster. The problem with rear-engined jobs is the fuel system. It's hard for me to believe it's all right to have fuel tanks all around you. I'd like them to abandon rear engines."

Both said they'd like to try a light, conventional roadster with Ford power. Foyt commented that one of the original roadsters, not offset as much as the later models, would probably do the job. (Later designs normally carried a 300-pound weight bias on the inside rear wheel for more bite on turns.) Jones added that a limited-slip differential replacing the solid axle would pick up speed.

Jones, first to crack the magic 150-mph mark, seemed to favor rear-engined cars, but explained: "One problem is the loss of 'feel' that someone's behind you. With a roadster, you could hear him coming. And we had a rule that you had to look back over your shoulder when going into a turn. With a big engine behind you, you can't see back. Any driver trying to pass better be sure he's all the way past before cutting in."

Jones went on: "The new tires have probably done more than anything to ob-

FORD ENGINE seminar in Dearborn this past February drew some of Indy's top mechanics. Specialists opened up on how to get the most from this engine



LEAPING OUT of his burning car in last year's race, Parnelli Jones rolled on ground to extinguish his burning clothes. Fire started during refueling

solete the roadsters. We're having a hard time building a car to keep up with them."

Foyt agreed: "They give much better side bite going into a turn and forward bite coming out."

In '64, Firestone made the first tires to last the full race. This year's tires are lighter, have a wider tread (up to nine inches) and different compound. Firestone claims four to seven more mph, softer ride and durability as good as last year's.

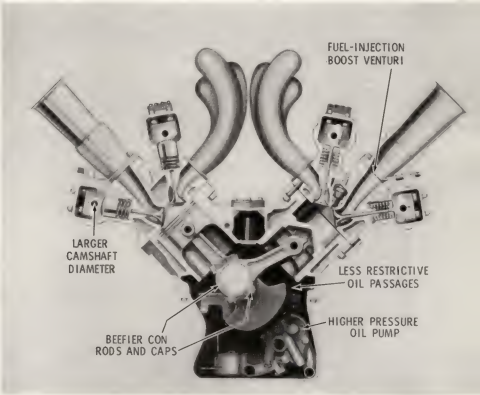
Firestone and Goodyear lease the Indy track and mile ovals throughout the off-season to conduct tire tests, and the front-running racers like the idea.

"You get a chance to try things on your car without pressure," said Jones. "You can try different ways through the corners and then sit down and figure out

TO CONFORM to new Indy rules, Ed Kuzma (left) and helper rebuild Jones' Lotus. A heavier skin and a 50 percent larger fuel tank have been added

NOSE MOCKUP is checked by A. J. Watson before skin is added. It's one of two Ford rear-engined cars to be driven by Rodger Ward and Don Branson

NEARLY HALF of this year's Indy entries will use this Ford twin-cam V8. Most changes from last year are for increased reliability, but fuel injection has boost venturi in the throttle bodies for increased mileage and power



why they did or didn't work."

Both Jones and Foyt bought Lotus cars for the coming season, but new rules regarding thickness of aluminum in monocoque shells and elimination of cowl tanks required that the cars be almost completely rebuilt.

Jones' "back-yard Lotus" will be wider and will carry more fuel. Otherwise they'll be similar. Foyt and Jones will also have a pair of British-made Lolas, which, along with the home-builts, will be stronger than the stock Lotuses. They seemed shocked that a thrown tire tread could have broken a rear suspension member in Jimmy Clark's Lotus and wrecked the car in the last 500. So maybe there is more sense than superstition in the long-time Indy practice of building a car twice as strong as is apparently needed.

Ward, as usual, will have a new car for the coming race. He placed second last year with a rear-engined machine, but it was heavy and didn't handle well. Ward claims it was better than any other roadster he's driven, but admits the 200 pounds it spotted the Lotus-Fords was too much. He expects the latest car to be more competitive.

It will be a semi-monocoque design. Engine and driver will be farther aft, with Ward in a semi-reclining pose. When such a car starts to spin, its rear end goes first and the farther back the driver sits, the sooner he gets the message.

The past few 500s have been described as sprint races run between yellow-light periods. We asked Jones, Ward and Foyt whether they used any strategy or just met conditions as they came.

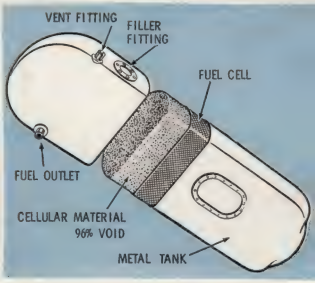
Jones, a smooth and extremely fast driver who likes to run out in front, but who's been plagued with equipment failure, said, "You can't decide it'll take so many mph to win and then run your 500 miles that way. I start out hard to build up a cushion. If I lose time in the pits, I'm still ahead. Once you've built up a lead, you can set an easy pace."

Help from the Pits

"I think everyone sets his race plans to a certain extent," said Foyt, "but as the race goes on you work with your crew, who tell you what's going on. Parnelli and I had a good duel going at the beginning of last year's race, and I was pushing. But after his pit stop, my crew told me he was out of the race. Ward was making many fuel stops and I lapped him twice, so all I had to do was hold 'er together for the rest of the race. I could have run maybe 6 mph faster, but I wasn't out to set a record. I just wanted to win."

Ward, a steady driver who lays back and relies on his equipment to bring him home in the money, said: "Until Firestone brought out their new tires last year, we could decide ahead of time pretty well how we'd run the race. We knew we'd have to make *at least* three pit stops for tires alone. Fuel was no problem.

RUBBER FUEL TANKS ARE REQUIRED this year. Here car owner J. C. Agajanian, driver Parnelli Jones, and engineer D. C. Cline examine Firestone's "Rosafe" tank (drawing at right), filled with foam baffling. It's claimed fireproof



"By the time you made your first pit stop, the race would have developed a pattern. You could tell who was going to be the toughest man and how your car was performing. I never feel it's important to lead early. Be within shooting distance and lead if you can lead easily. But you win by going 200 laps, not just the first few. It's more important to be able to run the last laps hard, if you need to. I'd rather overcome drivers because of their mistakes, rather than by charging.

"This year, strategy again will be important, because the rules say we have to make at least two pit stops. We can plan to stop on specific laps or, if we have the fuel capacity, run until a yellow flag."

Pitting During the Yellow

When the starter waves the yellow flag and yellow lights go on around the track, drivers must slow down and maintain position. There's been controversy over this rule; some say it means slow way down, others that it only means watch out.

"Pitting during the yellow flag isn't a big advantage," said Jones. "You don't have to slow down that much. You reduce speed and use extra care near the accident that caused the yellow, but then pick up the pace for the rest of the track. We don't have a close-up rule at Indianapolis . . ."

"Thank God," interrupted Foyt.

". . . that requires a drastic slowdown by the whole field assembled right behind the leader. I'm glad we don't. It penalizes the chargers or leaders."

"If someone's hurt, I'll stop my car, like we all did last year," said Foyt. "But I won't chance wrecking a $12,000 engine or throwing away a lead when nothing's wrong. If you've been running hard all day, you might have ring wear, and slowing way down will cause excessive blowby, fouling your plugs. Then, under a bunch-up, the drivers who've been taking it easy all day can pull up on you. When the green light goes on they go right by you, because your own car won't accelerate. If a driver runs hard and builds a lead, he's entitled to keep it. I'll pit when I have to, on the yellow when possible."

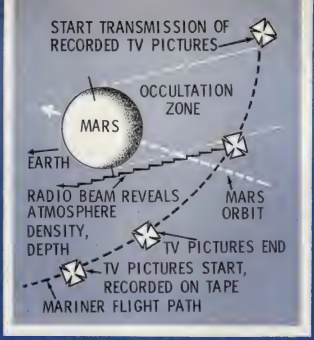
Ward disagreed. "As I read the rules, they say drop from race speed (about 150 mph average) to about 100 mph and then slow down even more at the scene of an accident. The 100 mph may sound fast, but on the Indy track it's slow. The problem is in administering the rule; every driver tries to protect, if not improve, his position. Officials must make snap decisions that can cost a driver $100,000."

At Indy, "fouls" are penalized by calling the driver into the pits for "consultation." This lost time can erase a driver's lead and cost him the race.

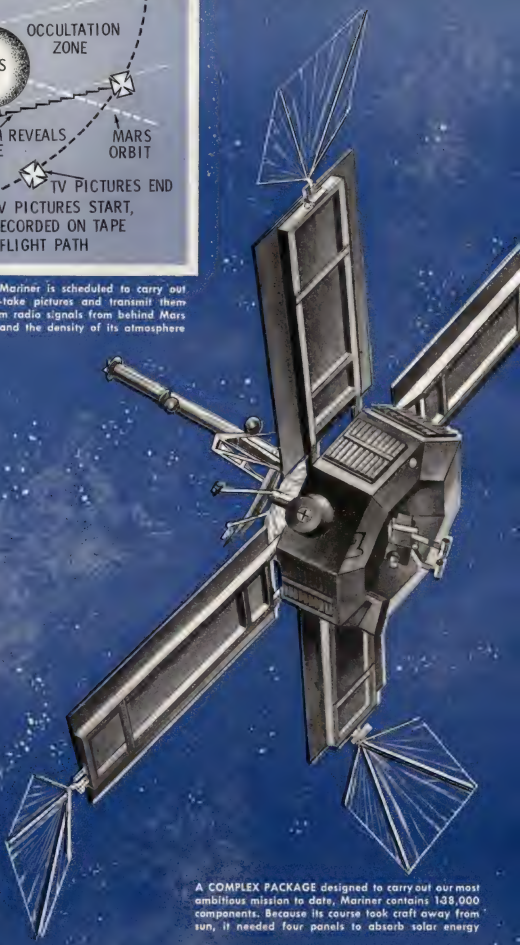
"I like the bunch-up rule on the mile tracks," Ward went on, "but it wouldn't work at Indianapolis. What they're considering now is a large clock face at the end of each straightaway, with numbers

(Please turn to page 226)

JIMMY CLARK IN SLEEK LOTUS-FORD (foreground) laps Art Malone's Novi-powered Studebaker Special roadster in last year's race. Clark later dropped out with a collapsed left rear suspension after one of the tires threw a tread



AT ENCOUNTER, Mariner is scheduled to carry out two experiments—take pictures and transmit them to Earth, and beam radio signals from behind Mars to test the depth and the density of its atmosphere



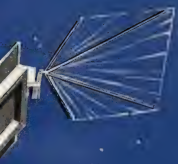
A COMPLEX PACKAGE designed to carry out our most ambitious mission to date, Mariner contains 138,000 components. Because its course took craft away from sun, it needed four panels to absorb solar energy

UNMASKING MARS

What Our Flyby Will Show

With luck, Mariner will photograph deserts, mountains and icecaps. It may also analyze Martian 'air,' solve the great canal mystery

By James Joseph



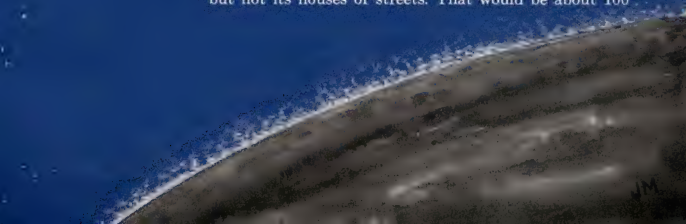
THERE'S A PINPOINT of reflected light in the southern Martian sky, a speck that grows slightly larger each evening since it first appeared. If there's a "man" on Mars with a telescope, he is certain to be concerned, for the object appears to be on a near collision course.

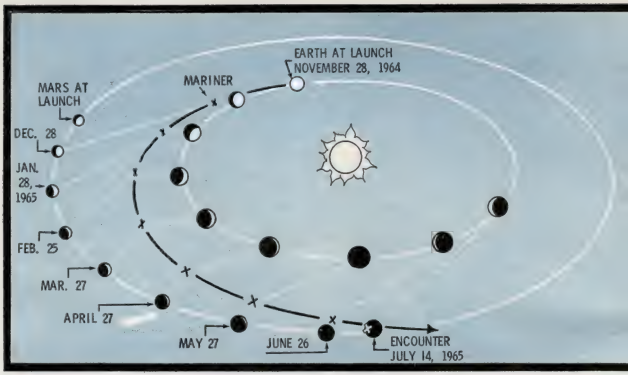
On the evening of July 11, 1965, the intruder sweeps in from the west but misses the planet by some 5400 miles as it cuts between Mars' equator and south pole. Moving at better than 11,000 mph (in relation to Mars), the object passes behind the planet and disappears in the east to become a piece of dead hardware endlessly orbiting the sun.

That piece of hardware is Mariner IV. The 13 hours and 20 minutes it may spend in the vicinity of Mars—that's the flyby time as designated by our scientists—would be the climax of a 325-million-mile trip that began seven and one-half months earlier at Cape Kennedy. If Mariner's 138,000 components are in good working order, and if the craft is properly oriented toward Mars, we should know a lot more about the "red" planet after July 14 than we do now.

Views 100 Times Larger

Mariner's most exciting assignment is to take 21 photos—all time allows—of Mars. The TV camera will pick up nothing smaller than two miles square, according to scientists at the Jet Propulsion Laboratory in California, which designed the craft and is directing the NASA-sponsored mission. If pointed at Earth from the same height, the camera might pick up the outline of a city but not its houses or streets. That would be about 100





times more than our scientists have ever seen of Mars.

"Even through the best telescopes the planet appears about as the moon does to the naked eye," explains Dan Schneiderman, Mariner's project manager. "Mariner's photographs would give us about what our telescopes see when they look at the moon."

Pictures that good could put an end to a lot of the speculation about Mars. Are there mountains, deserts and oceans on Mars? Are the deserts the scene of monstrous dust storms? Are the "patches"—the great areas that seem to change from green to brown with the seasons—really vegetation? Are they vast forests, as was once thought, or little more than arid plains with a scant spring growth of lichens?

Today, astronomers generally agree that the Martian "canals" don't represent the work of intelligent beings. But what *are* the many straight lines and streaks observed on the planet's surface?

The photo-mosaic map that Mariner may produce—a map covering an area 4000 miles long and 150 miles wide—could answer the above questions or at least provide some good clues to the answers. Mariner's TV vidicon is equipped with blue-green and orange-red filters to provide high contrast in the photos sent back to earth. Alternate photos will be taken through each filter.

In addition to TV, Mariner carries scientific sampling devices designed to function in seven different experiments. Some of the unknowns to be probed have intrigued man for centuries:

How dense is the Martian atmosphere? To find out, Mariner is scheduled to send radio signals that will pass through the atmosphere of Mars on their way to Earth. The extent to which the signals are bent and shifted in frequency will indicate how dense the atmosphere is and how far it extends above the planet's surface.

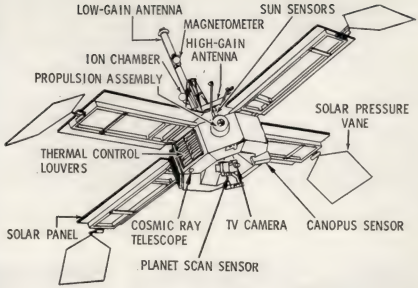
This is the "occultation" experiment. In the language of astronomers, occultation basically is an eclipse, what you have when a star disappears behind the disc of our moon.

If Mariner's trajectory takes it into the occultation zone behind Mars, the Earth will be in a direct line on the other side. Placing Mariner that precisely would be a fine bit of astronomical sharpshooting.

Spectrographic studies show that the Martian atmosphere consists mainly of nitrogen and argon, with only traces of oxygen and water vapor. Its density is thought to be only one-tenth that of Earth's atmosphere.

Precise knowledge will be essential if and when we try to land a capsule. A parachute system isn't worth a darn without an atmosphere to support it. That type of landing requires retro-rockets.

INCREDIBLE journey (left) of 325 million miles and 7½ months must be completed before Mariner flashes behind Mars. Arrow indicates where the craft was figured to be the day that this issue of PM hit the newsstands



TELESCOPE IN CAMERA (seen at bottom of craft) has focal length of 12 inches. Shutter consists of single rotating disk with four openings. Just above the camera is nozzle of rocket motor used in making course correction

Atmosphere also helps to control temperature. Scientists have determined that the Martian night is as cold as –150 degrees F. but that at midday at the equator it might be a comfortable 70 degrees F. Though this great range doesn't rule out the possibility of life (as we know it, anyway), it would take a hardy animal to withstand those extremes.

An atmosphere provides protection from cosmic rays, solar radiation and the bombardment of micrometeorites. It's a pretty safe bet that Mars' covering of gases—if it's as thin as we think it is—does little to shield its surface. Proof that it is thin would be another good reason for discounting the possibility of finding anything resembling "men" there.

Are the white masses at Mars' poles really icecaps? They grow and shrink with the Martian seasons and can be seen even with relatively small telescopes.

Early astronomers concluded that the masses were icecaps, much like those covering our own planet's poles. Later, scientists found that Mars' atmosphere was almost without moisture, and hit upon the idea that the white masses might be frozen carbon dioxide—Dry Ice.

Recent studies, however, indicate that the "caps" are indeed made up of ice crystals. But they melt rapidly, to indicate they're no more than an inch thick.

Mariner's atmospheric density tests and its polar photos should go a long way toward settling the question.

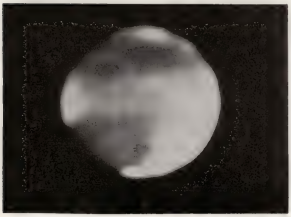
Has Mars a magnetic field? The instrument designed to determine this, called a helium magnetometer, is being flown for the first time on this mission. It measures not only the magnitude of a magnetic field but its direction as well. This equipment also provides the first opportunity to measure magnetic fields in interplanetary space at distances from the sun greater than Earth's orbit.

Is Mars surrounded by radiation similar to Earth's Van Allen belts? Four detection devices on Mariner will attempt to answer that question. Should strong belts be found, that wouldn't necessarily end future chances of landing men on Mars. After all, we on Earth manage to live under potent belts of radiation thousands of miles above our heads. A space vehicle would have to be sent in through a "thin spot," where the belt can be penetrated with less hazard. Mariner may lay the groundwork for a future mapping of such belts—if they exist.

Trip Guided by Stars

Mariner IV's 228-day journey—more than half finished as this is written—began at Cape Kennedy at 9:22 a.m., Nov. 28, 1964. Hurled first into a 115-mile-high orbit by its giant Atlas-Agena D booster and then into a rendezvous trajectory to

MIDCOURSE MANEUVER (above) was carried out when Mariner was 440,000 miles from Earth. Thirty-second "burn" of small rocket did the trick. If course hadn't been altered, the craft would have missed Mars by 151,000 miles



TWO OF BEST EXISTING photos of Mars (shown) were made with 200-inch Mt. Palomar telescope. Because much of the Martian surface has reddish hue, red filter produces fuller picture (right). Blue filter was used for other photo

Mars, the 575-pound craft shook earth's gravity and was on its way.

Just three weeks before, Mariner III had proved a dud when its fiberglass shroud failed to jettison, preventing its solar panels from opening. But Mariner IV's new aluminum shroud jettisoned right on schedule. Slowly, like a butterfly drying its wings, the power panels unfolded and locked into place at right angles to the craft.

Moments later Mariner's electronic brain, crammed with stored data and operational commands, ordered the sun sensors to seek the sun and lock on it. Sun "acquisition" would brake the craft's head-over-heels tumbling. It would also align the four power panels, each six feet long and three feet wide, to face squarely toward the sun. It was their function, not that of Mariner's rechargeable silver-zinc battery, to supply the craft's power during its long trip.

Sixteen hours after this was accomplished, the computer ordered Mariner—first spacecraft with the ability to stabilize itself by stellar navigation—to seek out the star Canopus and to lock on it. Stabilized only longitudinally, Mariner was spinning like a slow-motion top. Such lateral instability, were it allowed to continue, could affect the strength of Mariner's transmissions as it neared Mars. A second star-lock was imperative.

Canopus had been chosen with care. It is a huge star, located in the Milky Way, in a position perpendicular to Mariner's course. Furthermore, it is 1900 times brighter than the sun, making it fairly easy to pick out from among some 300 others lying along the craft's lateral roll axis.

On command, Mariner rolled to the right, its Canopus electronic-eye sensor sampling light from scores of stars. It successively locked on four bright stars—

(Please turn to page 222)

DETROIT LISTENING POST

By Ed Nelson

Is a Chevy "Mustang" in the Works for Next Year? What Happened to 300L's Missing 30 Horsepower

BOTH GENERAL MOTORS, in the person of the **Chevrolet Div.**, and **Chrysler**, represented mainly by **Barracuda**, are scratching hard to come up with a stronger counterattack against **Ford's Mustang.**

For '66, **Chrysler** will make basic changes in the **Plymouth Valiant** and **Dodge Dart**, but the **Barracuda** still will share primary elements like the floor pan and suspension system with the larger volume "compacts." For **Chrysler**'s sake, I only hope they sharpen up the body. As it stands, the **Barracuda** shell suffers from the stylists' effort to go in two directions at once—toward room for back seat passengers (which they achieved) as well as sleek exterior lines (which could be sleeker).

A bigger challenge to the **Mustang** may come from **Chevy. Ford** people see most of **Chevrolet's** moves as copies of **Ford** innovations—they think of the **Caprice** as a copy of the **Ford LTD**, and even consider the **Chevy II** as the **GM** version of the **Falcon.**

Without going into the merits of those claims, it's becoming clearer that the **"Chevy Mustang"** is due, by the current schedule, in the Spring of 1966. Like the **Mustang**, though, it'll be pre-dated, that is, registered as a '67. Will this car be the drastically re-done **Corvette** that is also rumored to be on the way?

HERE'S MY GUESS: The talk coming out of **GM's** Warren, Mich., Tech Center about a drastic new body is being **mistakenly** thought of as a reference to a new 'Vette. But **Chevy** has little reason to revamp the **Corvette** now; they just gave it a new engine, one that even competitors respect. At the time of the '65 introduction they gave it America's only four-wheel disc brakes. And the **Sting Ray** body—among the first of the new truly fast-backed breed—doesn't look that old. So I'm betting the new body will be on a totally new car.

Conversation in Detroit indicates **Pontiac Div.** wants a crack at that new body, too. **Pontiac** has been in love with the performance idea for years, but the **GM** no-racing rule has been enforced so well that people are forgetting the division's stock car successes of a few years ago. The mahogany desk set in the **General Motors Building** hasn't yet decided whether **Pontiac** will get to share the new shell, however.

SPEAKING OF DISCS, they'll soon appear—maybe by '66 introduction—as extra-cost options on every **General Motors** car. Figure they'll be standard equipment on the higher cost models. The move will help support the industry's image of concern for public safety.

Spreading popular concern for vehicle safety, as well as today's long warranties, are responsible for a rising interest of manufacturers in enforced periodic inspections. The District of Columbia and 20 states now require them. The car manufacturers' association has donated money to support the program in the past, but interest from individual manufacturers (except **Dodge**) has been half-hearted. Now promotion of regular inspections will get the full treatment.

WORRY ABOUT DETROIT'S safety image won't stop horsepower increases, however. The Big Three all will boost horsepower next year. And **Chrysler** as well as Lincoln is preparing a monster engine with displacement in the area of 462 cubic inches. Chrysler's probably will be limited to use in the **Imperial** at first.

"Will it be a high-revving, high-performance engine?" we asked one of the insiders. He snorted, then barked back: "Cars are getting so damn big they just gotta have big engines."

CHRYSLER'S showpiece in Performance-*cum*-Luxury competition has been the alphabet series of its **Chrysler 300.** Last year's snarling entry, the **300K**, had a hot 390 hp. But this year, with growing fever for performance, the car took a step backward to 360 hp. Why?

Apparently the stylists won this battle with **Chrysler's** engineers. The hood line is so low this year that it wasn't possible to stuff in two four-barrel carburetors. Hence the **300L** lost 30 hp.

Inside Our

Fabulous Pivot-Wing Plane

Here's the story on what makes the amazing F-111 the most versatile aircraft ever built

By Kevin V. Brown

VETERAN TEST PILOT Dick Johnson, a slim, grim-faced icicle, nursed the strange-looking plane into takeoff position. He checked the controls, glanced at co-pilot Fred Voorhies, then started down the runway with a smooth roar.

The plane was off the ground in less than 3000 feet, climbing rapidly, when it began assuming a different shape. First the leading-edge slats and trailing edge flaps, down for takeoff, were retracted into the wings. Next the wings themselves began swinging back, locking at about 50 degrees in a more streamlined silhouette.

It accelerated steadily while climbing, reaching Mach .9 before leveling off at 30,000 feet. Then, simultaneously pushing forward on a pistol grip and the two throttles, Johnson and Voorhies swept the wings all the way back and, for the first time, plunged the extraordinary plane through the sound barrier.

And the amazing F-111, an aircraft conceived in necessity and born in controversy, flew past another milestone in a life that may yet see it become one of the greatest airplanes in history.

It's built to:

- Take off from raw jungle strips or catapult from decks of atomic carriers.
- Hover for hours at minimum speeds or streak supersonically across oceans.
- Skim unerringly at treetop level beneath enemy radar-and-missile defenses, or zoom into the stratosphere and outfly and outfight anything there.
- Carry any airborne weapon now in service, plus one new exotic system.
- Use these missiles and rockets, some with nuclear warheads, against pinpoint ground targets in guerilla warfare, or enemy aircraft in high-altitude combat.

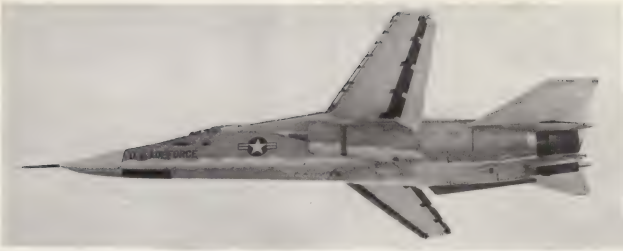
It can do anything any other airplane *can* do, plus a few more things that all of the others can't do—high or low, fast or slow, anywhere in the world.

Some people call it the "B-111," since it *could* replace bombers. Others, because of its versatility, say it may be the last combat airplane ever built.

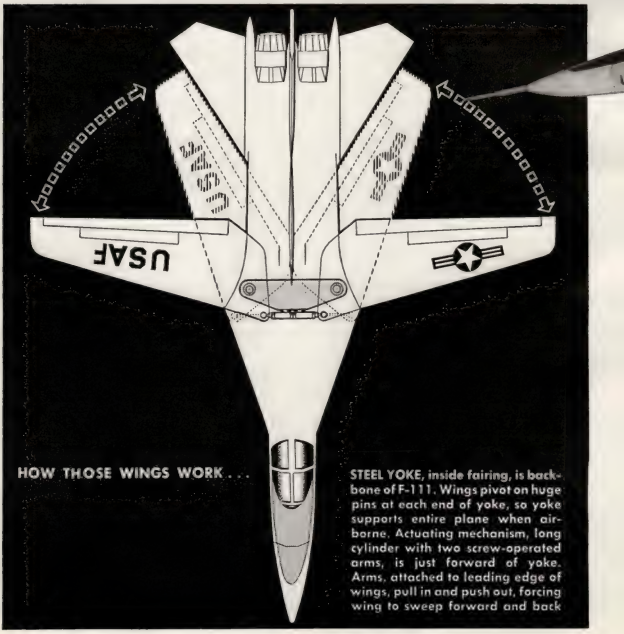
How could any one plane, contrary to all rules of aerodynamics and common sense, be so many things to so many people? The F-111 is all airplanes in one.

It's generally conceded that, if necessity is the mother of the F-111's invention, its father was General Frank Everest, then commander of the Air Force's Tactical Air Command.

He saw the coming problem of building



SWEPT FORWARD, F-111's wings are rigged for slow speeds, landings or takeoffs, with slats and flaps down. In this position, F-111 has wingspread of 63 feet; swept back, less than 32 feet. Stabilizers operate independently



HOW THOSE WINGS WORK . . .

STEEL YOKE, inside fairing, is backbone of F-111. Wings pivot on huge pins at each end of yoke, so yoke supports entire plane when airborne. Actuating mechanism, long cylinder with two screw-operated arms, is just forward of yoke. Arms, attached to leading edge of wings, pull in and push out, forcing wing to sweep forward and back

YOKE, shown in rare assembly-line view, is the backbone of the F-111, supporting wings and entire airplane when airborne. Wings pivot from pins at each end of 14-foot yoke

SWEPT BACK, wings give F-111 appearance of delta-wing plane. Spoilers on upper surface have cut out and horizontal stabilizers now operate as both elevators and ailerons

longer and longer runways to accommodate TAC's larger and faster fighters, while the wars they were expected to fight seemed to be getting smaller and smaller.

Large runways are easily pinpointed and destroyed by an enemy. If they are built out of his range, then the fighters which operate from these runways also would be out of range of the targets.

The General's White Blackbird

So the general asked for a white blackbird. He wanted a plane that could take off or land anywhere, even a sod strip hacked out of a jungle, and yet fly across oceans without refueling. Further, he wanted a plane that could "loiter" for hours at subsonic speeds over a given spot to maintain aerial supremacy. But it also had to streak at speeds up to 1700 mph whether clipping the treetops or skimming the anvil clouds above 60,000 feet.

The basic breakthrough needed to make such outlandish performance possible was the variable-sweep wing. The plane had to have a wing that would stand almost straight out for short takeoffs and slow flight, then sweep back for faster subsonic speeds or even faster supersonic speeds. Once achieved, the controversy began.

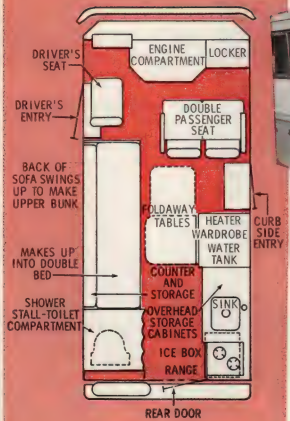
The F-111, then a paper airplane called the TFX (for tactical fighter, experimental), was received with so much enthusiasm that the civilians in the Pentagon decided all three services should have it. The Army begged off early, but the Air Force and Navy were forced into a mixed marriage that neither really wanted.

That was only part of the controversy. The fight for the $10 *billion* contract was spectacular and, when Boeing (thought by many to have the best design) didn't get it, screams of "politics" were cosmic. All of which merely points up the fact that no plane in history was born under such a cloud of suspicion. In spite of those who will always think of it as "second best," the product launched by the winning team of General Dynamics-Grumman is a remarkable and revolutionary aircraft.

The movable wings are only one of its many innovations. To examine those innovations at first hand, *Popular Mechanics* visited the General Dynamics plant at Fort Worth, Texas. It was here that the first prototype F-111 was made and test flown, and where the major portion of the initial order of 23 aircraft are being fabricated and assembled. Grumman Aircraft on Long Island will assemble the Navy version.

We walked up and down the assembly line at Fort Worth, looked inside some of the F-111s in various stages of construc-

(Please turn to page 214)



Sedan-Sized Camper

Four adults and two children are accommodated in a new camper which includes a separate toilet and standard kitchen facilities. The unit is 16 feet, 5 inches long and 6 feet, 5 inches wide. Its interior height is 5½ to 6 feet, providing headroom, storage space and two overhead bunks.

Quad Cub, with a Chevrolet chassis and Grumman body, sells for $7490 from Quad, Inc., 1400 Burbank Blvd., Burbank, Calif.

Midget Universe

A variety of sky maps can be projected with this miniature planetarium. Light source within transparent Plexiglas globe projects star and planet locations (which are printed on globe) to inner surface of dome overhead. "Earth in space" (left) is one of seven different globes available. Maker is Farquhar Globes, Philadelphia.

PM OWNERS REPORT

CORVAIR

A Nationwide Survey Based on 995,118 Owner-Driven Miles

Style, Handling Snap Offset Wind Noise

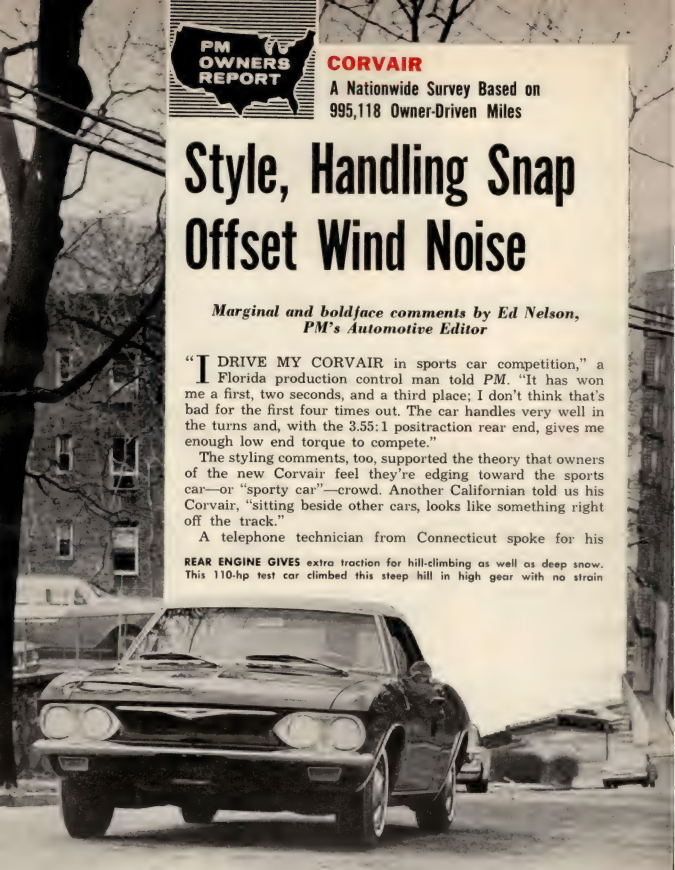
Marginal and boldface comments by Ed Nelson, PM's Automotive Editor

"I DRIVE MY CORVAIR in sports car competition," a Florida production control man told *PM*. "It has won me a first, two seconds, and a third place; I don't think that's bad for the first four times out. The car handles very well in the turns and, with the 3.55:1 positraction rear end, gives me enough low end torque to compete."

The styling comments, too, supported the theory that owners of the new Corvair feel they're edging toward the sports car—or "sporty car"—crowd. Another Californian told us his Corvair, "sitting beside other cars, looks like something right off the track."

A telephone technician from Connecticut spoke for his

REAR ENGINE GIVES extra traction for hill-climbing as well as deep snow. This 110-hp test car climbed this steep hill in high gear with no strain



Owners Like

Sleek styling	(55.3%)
Easy handling	(47.3%)
Comfortable bucket seats	(25.2%)

But Dislike

Excessive wind noise	(13.4%)
Cramped rear seat	(12.6%)
Water leaks	(11.7%)

GAUGES ARE DEEPLY recessed, yet readable. Powerglide control is inconvenient, one engineer felt, but other owners didn't find it worthy of comment. PM testers found no distracting windshield reflections at night

Only two percent had considered any Plymouth, including Barracuda →

In the other five cases, an average 86.6 percent said they'd buy again →

fellow Corvair owners when he said, "The all-new styling is more competition for Mustang and foreign cars." And indeed, 19.4 percent of the owners reporting said they'd considered a Mustang before deciding on their Corvair Monza. (About 80 percent of Corvair sales are Monzas, so that's what we concentrated on.)

Nevertheless, Corvair owners aren't as overwhelmingly enchanted with their new cars as we've found the owners of other cars checked during the '65 model year to be. Although nearly 85 percent said they'd buy another Corvair, this is a bit below the average of the other five '65 cars on which we've presented owners' reports. And the percentage who called their Corvairs Excellent—only 50.8—is also the lowest below the 59 percent average for '65s reported.

A major complaint, as often seems the case lately, is traceable to the curved windows. Wind noise topped everything in the brickbat list; leaks, largely at the windows, were third; and the windows themselves were seventh.

The Corvair, increasingly, has the flavor of a more-or-less high performance little rig, so not many of the owners complained about fuel mileage. The 110-hp version of the Corvair engine is clearly the most popular: 77.8 percent of the owners have it. And the biggest overall fuel consumption figures came from the 23.9 percent who reported 19 to 20 miles per gallon.

For performance and fuel consumption checks, Chevy provided a four-speed, 140-hp Corvair. We hooked up the *PM* Tracktest fifth wheel with electric speedometer, odometer and fuel meter for precise results (and found the Corvair speedometer one to three miles an hour slow, the odometer a surprising 7 percent slow). Here are the mpg figures:

True mph	30	40	50	60	70
Fuel consumption	29.07	27.61	23.82	21.43	19.37

How about acceleration times? They don't give a full indication of the fun of driving the Corvair with its new parallel-link rear suspension, since they're taken, of course,

in a straight line. But, averaging several runs at each speed in each direction to compensate for wind and terrain variations, here's what we did, shifting at the 5500-rpm red line:

0-60 mph (true)—12.1 seconds, in 1st, 2nd and 3rd
40-60 mph (true)—6.0 seconds
50-70 mph (true)—7.3 seconds

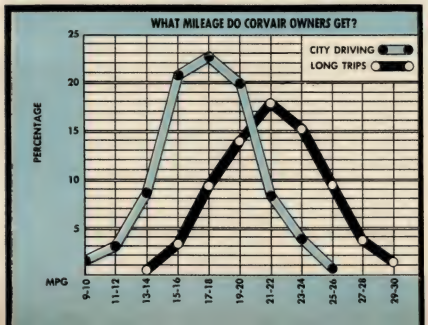
Corvair this year got the bigger Chevelle's drum brakes. We checked them for fade with the regular six hard stops from 60. They got pretty aromatic, but didn't pull either way and required pedal pressure rose from 22 to only 30 pounds. In two extra stops it rose to only 32 pounds.

Now let the Corvair owners tell you in their own words what they've found about this sleek new compact. Here are remarks picked to illustrate the most widespread reactions, starting with the five most popular praises:

"I like its continental look. It makes people stop to look it over."—Michigan office supervisor.

"The new body style doesn't look like a box."—Texas pharmacist.

WEIRDLY CONVOLUTED Monza luggage compartment is dictated by the necessity for room to turn the front wheels. Filling windshield washers is easy. Only a few owners are still disturbed by lack of grille



CORVAIR ECONOMY isn't particularly outstanding for a small, lightweight car. But owners, who consider it a hot little semi-sportster, no longer demand great economy. Some commented that consumption is up slightly

A BURR ON THE timing mark cut into crankshaft pulley has, in some cases, gradually whittled away at Monza fan belts. The factory says warranty records don't show the problem, but owners might do well to check it

There's more than meets the eye to soft-line styling →

He switched from a '62 Corvair to an Impala —and back again →

And here we thought the buckets were supposed to hold you in place during hard driving →

Since these curves became popular, we haven't checked a car whose owners didn't complain about them →

Detroit should appreciate a man who appreciates what compromises he's making and why →

Ours, unhappily, was a prime example of leaks →

But assembly and workmanship complaints have been more common on other makes →

"It's easy to clean snow off and easy to wash."—Massachusetts machinist.

"It's fun to drive and easy to operate in traffic."—California banker.

"It's small and easy for a woman to manage."—Massachusetts housewife.

"It has made driving an American automobile fun again."—Pennsylvania radio announcer.

"The bucket seats are comfortable with plenty of adjustment room."—Michigan speedometer repairman.

"Bucket seats position the driver well."—Ohio steelworker.

"The bucket seats are large for freedom of movement and are comfortable on long trips."—Minnesota market analyst.

Although some owners may believe the Corvair is a candidate, the please-everybody car has yet to be built. Here are samples illustrating the five most common complaints:

"Wind whistles when windows are closed tight. Dealer tells me this is due to curved windows and occurs in all GM cars this year, even Cadillacs."—Connecticut retired man.

"The wind whistles in the door windows. My car needs to have the windows aligned."—Oklahoma service advisor.

"Very annoying whistles when I travel over 40 mph."—Connecticut corporate officer.

"I don't like the narrow back seat. I have fat friends."—Minnesota teacher.

"Armrests are in the way; both doors have to be open to knock down the back seat."—New York housewife.

"There's limited rear legroom, but I'll sacrifice it for the small overall size."—Connecticut banker.

"I would like to see a corrugated or rubber surface added to the fold-down side of the rear seat: things wouldn't be so apt to slide."—California personnel analyst.

"I have never seen one yet that didn't leak in the front compartment."—Retired Illinoisan.

"The windows don't seal against the wind and rain."—Georgia naval officer.

"It leaks tremendously along the dashboard area."—Connecticut executive.

"It's hard to hold on the road in a cross wind."—Ohio utility executive.

"The workmanship is poor—there's loose door paneling and carpeting, a piece of inside trim fell off, and the wheels needed aligning."—Illinois teacher.

"The front end sways on windy days."—Ohio steelworker.

"Poor assembly at the plant. The windshield wipers won't work, upholstery around the rear windows fits sloppily, and the turn signals won't release."—Texas pharmacist.

"I would buy another Corvair if they correct the poor workmanship and cheap materials; otherwise, I'll buy another make."—Illinois accountant.

This is the kind of pressure that gets results—if it's practiced widely enough

Let's switch back to the bright side for the second group of praises—from easy parking to thrifty operation:

"Easy to move in traffic or to park."—Arizona druggist.

"The Corvair is easy to slide into and out of tight spaces."—New Jersey steel salesman.

There's little there to reach beyond an awkward Powerglide lever—and maybe a lighter

"Everything on the dash is within easy reach."—Michigan office supervisor.

"There's no floorboard heat from the engine to cause hot feet in the summer and the engine noise is left behind."—Georgia sailor.

"I don't have to bother with water or anti-freeze."—Ohio executive.

Only 15¼ feet long, the Corvair can sneak into spaces that others can't

"I like Corvair's engine in the rear for traction."—Colorado engineer.

"I wanted a small car that would fit my garage."—California warehouseman.

"A good size for a woman to handle."—New Jersey homemaker.

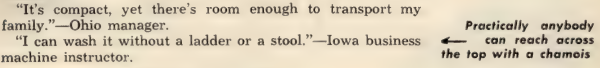
Practically anybody can reach across the top with a chamois

"It's compact, yet there's room enough to transport my family."—Ohio manager.

"I can wash it without a ladder or a stool."—Iowa business machine instructor.

(Please turn to page 212)

SUMMARY OF OWNERS REPORT



Best-liked features	
Overall styling	55.3%
Ease of handling	47.3
Bucket seats	25.2
Traction in snow	21.5
Power and performance	14.1
Ease of parking	13.4
Dashboard	13.0
Rear, air-cooled engine	12.1
Size	10.9
Economy of operation	10.5
Roominess	9.3
Upholstery	8.5
Cornering ability	6.9
Instrument panel	6.5
Folding rear seat	6.1
Ride	5.7
Comfort	5.7
Steering	4.9
Front styling	4.9
Gas mileage	3.6
No hump in floor	3.6
Suspension	3.2
Interior	3.2
Easy cold starting	2.8
Rear styling	2.8
Corvair decision based on	
Styling	<5.8
Economy of operation	25.9
Previous Corvair ownership	23.5
Price	14.6
Size	16.2

Least-liked features	
Wind noise	13.4%
Rear seat	12.6
Water leaks	11.7
Wind sensitivity	11.7
Workmanship, assembly	10.9
Rattles, squeaks	8.9
Windows	8.9
Gas mileage	8.1
Carburetor trouble	7.3
Heating, defrosting system	7.3
Noisy engine	6.9
Dashboard	6.9
Suspension	6.1
Front end too light	6.1
Front styling	6.1
Gas fumes from heater	5.7
Shift-lever location	5.3
Rear styling	5.3
Air leaks	4.9
Bumpers	4.5
Transmission trouble	4.0
Lack of room	3.6
Rear fenders	3.6
Bucket seats	3.6
Fuel economy	
About as expected	46.2
Better than expected	5.7
Not as good	44.9
Buy another Corvair?	
Yes	84.9
No	15.1

Other car considered, if any	
None	44.9%
Mustang	19.4
Volkswagen	5.7
Chevrolet	5.3
Tempest	4.0
Chevelle	3.6
Falcon	3.6
Is Corvair family's only car?	
Yes	44.9
No	55.1
Make of other car	
Chevrolet	18.2
Another Corvair	6.9
Ford	6.1
Pontiac	4.9
Oldsmobile	4.5
Buick	3.2
Make of car traded in	
Corvair	32.9
Chevrolet	18.3
Ford	4.5
Chevy II	2.4
Volkswagen	2.0
Plymouth	2.0
Dealer service	
Excellent	40.1
Average	38.9
Poor	19.0
Would you buy from him again?	
Yes	65.0
No	21.1

12-Month

A father-son test team reports on how well these new shoes wear and how your feet feel after living in them for a year

By Jackson Hand

LAST SPRING, I shelled out $40 for a pair of shoes, more than I'd ever paid in my life. But I was overcome with an impulse to find out if they were any good. Though they looked like any other pair of handsome wingtips, they were constructed from a brand-new man-made material—Corfam.

They were given their toughest test the very first time I wore them. I got caught in a sudden downpour. Because it's next to impossible to get a taxi in New York City when it's raining, I slopped through puddle after puddle on my way to Grand Central Station. Water sloshed between my toes with every step. The shoes were too wet to keep on with any comfort, so I slipped them off once I found a seat on my train to the suburbs.

The next day I inspected the damage. The leather soles looked leached and gray enough to have been boiled in water. The insoles, also leather, had loosened and curled up at the edges.

The Corfam uppers were coated with

A

B

C

ALL THREE SHOES have been worn for one year, but the two Corfam shoes (B, C) have never been shined. Cordovan leather shoe (A) was shined before every wearing, which was on an average of once every two and a half days. Corfam loafers (B) were worn almost every day by soccer-playing 15-year-old, both to school and at camp. Soles and heels shown on them are the second set they've had. Corfam wingtips (C) were worn primarily on "state" occasions, but began their in-use career with a thorough soaking

SWIPE OF DAMP CLOTH is all it takes to clean Corfam loafers that have never been shined in 12 months of hard use. The plastic material resists abrasion

Test of Corfam Shoes

the dirt of city streets. I rubbed a thumb over a toe, and the dirt came off. Encouraged, I put a damp rag to both shoes and, within minutes, they looked new and shiny again. And they were still soft and pliable. Score one point, I thought, for this man-made miracle.

I was so impressed that I soon bought a pair of loafers—also made of Corfam. They, too, were on the expensive side. But now, with more manufacturers producing Corfam shoes, you can run your own test this spring with an outlay of about $15.

For the Real Test

Of course, one soaking doesn't authenticate a footwear miracle. Tough daily wear is what counts. And that's what Jeff, my 15-year-old son, specializes in.

When school started last fall, he adopted the loafers. Except for an occasional evening when I'd preempt them, he wore them almost constantly. When he made the soccer team, our backyard became a practice field—and those loafers played many a hard game at "inside right."

Jeff went through one pair of heels and soles. But the uppers are still almost as good as new. On the other hand, some of Jeff's friends have just about demolished leather loafers that were new at the start of school.

Now that it's a year since Jeff and I first stepped into Corfam shoes, here's a brief evaluation of them:

- They are the lightest feeling shoes that either of us has ever worn. And on the scale they weighed two ounces less than any of several pairs of comparable leather shoes.
- I expected that the stitching would tear out, as often happens with plastic items. But it didn't—even where fine construction put seams almost at the very edge of the Corfam. The intact stitching may be due in part to the good workmanship in the shoes. (So far, Corfam is being used only by the better manufacturers.)
- Since Corfam is a plastic, I thought the shoes might develop an unpleasant odor. Neither pair did. The dress shoes I soaked in New York City smell only like their leather lining.

There is no offensive smell because Corfam, like leather, breathes and allows moisture to escape.

- Without shoving a meat thermometer into my foot I can't be positive—but I believe Corfam shoes are colder to wear in winter than leather. Perhaps the material has less insulating value than leather.

Neither of the two pairs of Corfam shoes has ever been given a coat of polish. A damp cloth is all that's needed. Corfam has a luster that just doesn't dull. Polish if you want to, but it isn't advised because wax tends to seal the pores. Experts say

(Please turn to page 192)

FOOT PLANTED firmly against small end, the brawny tosser stands ready to accept caber. It may take as many as six strong lads to carry caber onto field

UP SHE GOES. Stooping, the tosser slowly raises the tree trunk, careful to balance it against his shoulder. Here's where real strength pays off

It Takes a Braw Scot to...

TOSS THE CABER

Flipping a 285-pound tree trunk can be fun . . . if you're a Scot and as big as a tree yourself

By Patrick K. Snook

ASIDE FROM HAGGIS—a kind of pudding cooked in a sheep's stomach—there's nothing more peculiarly Scottish than "tossing the caber."

It's strictly a man's sport, for it takes lads of Paul Bunyan proportions to even lift the caber—a teenage telephone pole. The event is always the highlight of the many summer games, or "gatherings."

The caber is the trunk of a fir tree. It may be as long as 21 feet and weigh as much as 285 pounds. When the brawny competitor is ready, he places a foot against the caber's small end—it's a tree trunk, remember—and several assistants upend it. The tosser stoops and hoists it up, steadying it with his shoulder. With his fingers laced under the bottom, he raises the small end until it is at about the level of his elbows. Then, with the caber in precarious balance, the kilted giant lumbers into a good run.

He allows the caber to tilt forward as he gathers speed. Then, at the right moment, he gives a prodigious heave.

If his timing is good, the caber will hit on its heavy end and fall with its small end pointing away from the tosser and in a direct line with him. Though accuracy—not distance—is the point of the game, some champions can flip the tree trunk some 40 feet.

Last summer, I flew by Scandinavian Airlines to attend the Royal Highland Games at Braemar and saw a cherubic-faced farmer named Sandy Campbell in action. He stood six-feet-seven, weighed 20 stone (280 pounds) and had arms as thick as small trees. On that day he made two magnificent tosses, both falling within five minutes of the 12 o'clock position.

There are a number of stories about the origin of the sport. One indicates that it goes back to the early days of lumbering in the Highlands, when cut timber was carried out by hand.

When the trail crossed one of the region's many swift-running streams, the logger, like gargantuan Sandy Campbell, simply reared back and tossed it across.

EASY DOES IT. The contestant raises the caber until its end is near elbow level and sights ahead before lumbering into a run to build up momentum

UP AND AWAY. Putting every last ounce of muscle into the heave, the tosser ends up on his toes, his arms overhead. Caber is eased into slow arc

GOOD TOSS! Caber will land just about right on its thick end and fall almost in direct line away from tosser. Accuracy — not distance — pays off

No Slaving in This Galley

No cubbyhole cookery on the 1965 Hatteras 50. Designed to produce something more elaborate than coffee and sandwiches, the galley is equipped with a 14-cubic-foot refrigerator-freezer, four-burner electric stove, dishwasher, double sink and disposer. Boat's price? Only $102,000.

Old-Style Dory in Fiberglass

The Doryette is a traditional double-ended design executed in fiberglass which is available in a sailing version ($495 with sails) and rowing version ($294) from the Doryette Corp., 276 Alter Rd., Detroit, Mich. 48215.

Tearful Greeting

Intruders will likely be discouraged when they hit the trip cord of an electrically actuated tear gas cartridge. With the cartridge plugged into its socket, a tug on the trigger switch sets it off. The complete kit is $18.95 from Tear Gas Devices, 65-D Broad St., Stamford, Conn.

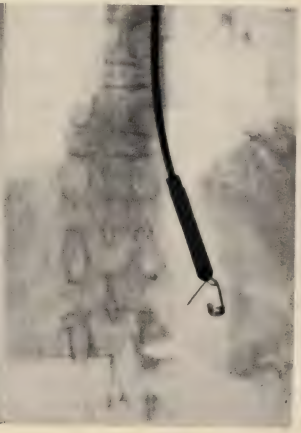
Roof Lights Attach Like Car-Top Carrier

A removable roof rack can carry a rotating dome light and any combination of warning and flood lights. It mounts or dismounts in about 20 seconds, according to the manufacturer, allowing a patrol car to be turned into an unmarked car at will. Original installation takes about a half hour, without drilling holes in the roof. The set of special flood lights has a 300-yard range and a 30-yard spread at a 30-yard distance. The Wood Lite was invented by William Wood, police chief of Holly, Mich., and is made by Industrial Die & Mfg., Fenton, Mich.

On-Off Magnet Unpins Pin-Swallowers

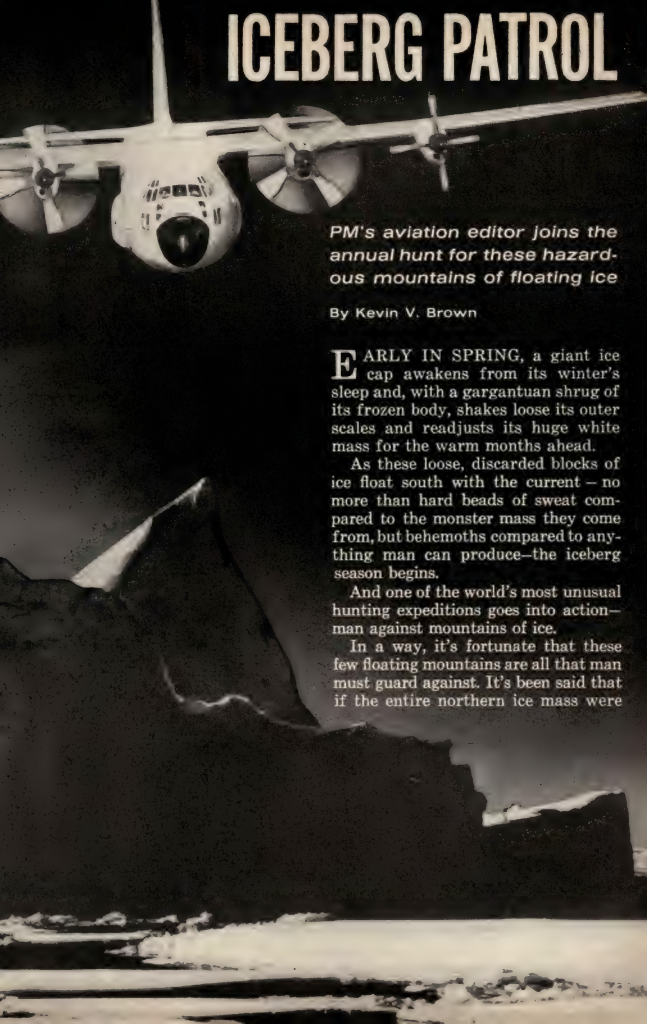
Removal of an open safety pin from a child's stomach can be done safely with a new General Electric instrument that pulls the pin out, rounded end first (lower right). The secret is in the instrument's iron tip, which can be magnetized at will.

Watching under a fluoroscope, a doctor guides the instrument to the rounded end of the pin. Via cable inside the plastic tubing, he pushes a permanent magnet forward to contact the iron tip, causing it to be magnetized and pick up the pin.



ICE-PATROL OBSERVERS plot iceberg paths on chart in preflight preparations (top) and confirm estimates with "eyeball" observations during aerial patrol (bottom), taking pictures to establish exact sizes

ICEBERG PATROL



PM's aviation editor joins the annual hunt for these hazardous mountains of floating ice

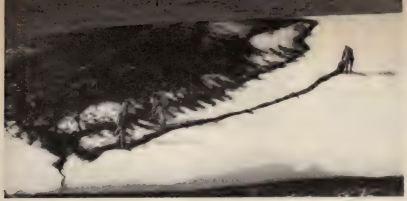
By Kevin V. Brown

EARLY IN SPRING, a giant ice cap awakens from its winter's sleep and, with a gargantuan shrug of its frozen body, shakes loose its outer scales and readjusts its huge white mass for the warm months ahead.

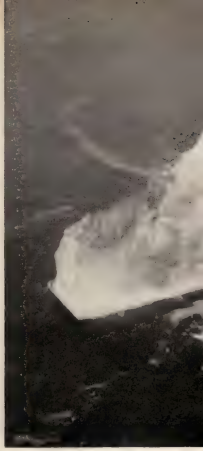
As these loose, discarded blocks of ice float south with the current – no more than hard beads of sweat compared to the monster mass they come from, but behemoths compared to anything man can produce–the iceberg season begins.

And one of the world's most unusual hunting expeditions goes into action–man against mountains of ice.

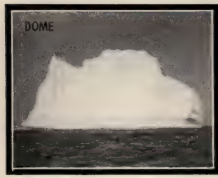
In a way, it's fortunate that these few floating mountains are all that man must guard against. It's been said that if the entire northern ice mass were



CARBON BLACK was spread on grounded berg to test its heat absorbing qualities in early Coast Guard attempt to destroy icebergs. Experiment failed, said straight-faced report: "No marked demolishing effect"



THERMITE BOMBS, which produce temperatures up to 4000° F. when they burn, were used in another experiment to melt or disintegrate icebergs. Thermite explosion made pretty pictures, but did nothing to berg



suddenly to melt, it would flood the world.

These frozen, broken chunks, however, are dangerous enough. They break off, or "calve," from the mother ice. Most of the bergs are blocked by land masses in both hemispheres or, if they reach open water, melt relatively quickly. But those icebergs that calve from the glaciers of western Greenland, by an accident of geography, are protected in the cold, narrow waters between Greenland and the eastern coast of Canada. Most melt before they reach the 48th parallel near Newfoundland, but many do not, floating with the current directly into the path of the most heavily traveled shipping lanes in the world—those between the United States and Europe.

It is here that the "unsinkable" *Titanic* rammed its way into an iceberg and history in 1912, going down on its maiden voyage with 1500 souls, and it is here that the International Ice Patrol tracks the icebergs now. While its work is paid for by all nations whose shipping benefits from the service, the operation itself is entirely the work of the U.S. Coast Guard.

Years ago the patrols were done by surface ships, but today the major work is carried on by air. Turboprop Lockheed C-130 *Hercules* fly Coast Guard crews over the berg-packed waters of the Grand Banks, an undersea shelf southeast of Newfoundland, where most of the icebergs break out into open water and become a hazard to shipping.

CONVENTIONAL BOMBS were dropped on other bergs from Coast Guard planes, but only left pock marks behind. Coast Guard gave up, went back to tracking

ICEBERG ALLEY is icy strait between Greenland and Canadian coast. Bergs that drift south of Newfoundland are targets of aerial ice patrols

ICEBERG IDIOSYNCRASIES: Dome bergs have average speed and endurance. Pinnacles and drydocks sail faster and erode quicker. Tabulars are largest and slowest. Growlers are not bergs but smaller pieces that roll and hiss, churn ocean into foam

The patrol lasts from mid-April, when the bergs begin floating south of the 48th, until mid-May, when most of the big ones have melted. *Popular Mechanics* sent me out to fly one of these patrols during this critical period.

Search Starts Before Dawn

An ice-patrol day begins in pre-dawn darkness when the aircraft crew and ice-patrol personnel report to base operations at Argentia, Newfoundland. Ice-operations officer, Lt. Cmdr. Rudy Lenczyk, an intense young oceanographer with close-cropped hair, scours the weather forecasts and the previous day's sightings by the Coast Guard plane and other surface vessels. Then, with his two assistants, Ensigns Dan Neely and John Goras, who will fly the patrol as observers, he charts each berg, estimating where each will be today according to such variables as its type, its size, the ocean current, the wind, and the sea and air temperatures. Each has an effect, but nothing can equal an "eyeball" identification, and all three know it.

So, in calm but hurried silence, they check the reports on each berg, make their calculations, and mark their maps. The preflight preparations are just as vital as the flight itself, and they go on for several hours. Without them, the flight can become a haphazard series of sightings of no one knows what. Each berg must be identified on each flight, according to type,

(Please turn to page 206)

Little Squirt

Something new for fishermen is a whisper-quiet jet trolling outboard powered by a 12-volt electric motor.

It operates on a standard 12-volt auto battery. Weighing only 27 pounds, it features 360° steering and a remote rheostat for controlling speed. Height adjustment allows it to be raised or lowered as much as 3 inches on the transom.

The Jet-Trol sells for $99.95 f.o.b. the Lawrence Mfg. Co., Chaska, Minn.

10-Door Camper

No, there wasn't a fire sale on car doors.

The 10 doors were already in place when the front two-thirds of one Corvair Greenbriar and the rear two-thirds of another were joined to make this camper. The pieces were widened a foot and mounted on a lengthened 1961 Buick frame. A 325-hp Buick V8 with Dynaflow sits midway on the frame.

The cabinets inside can be replaced by two seats, to carry up to 10 passengers.

Owner Glenn Goodban of Burbank, Calif., has logged over 30,000 miles on his camper and reports that, along with performance and comfort, he's getting 12 to 14 mpg.

Pushbutton TV Exams

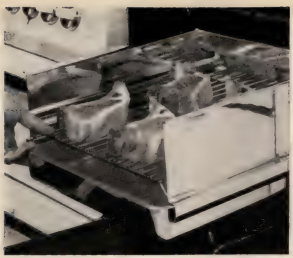
It's exam time. The TV instructor asks a question. Students at home pick out an answer by pushing one of four response buttons—and learn immediately whether they're right or wrong.

Further, with the new Educasting System, they learn the reason why an answer is correct or incorrect.

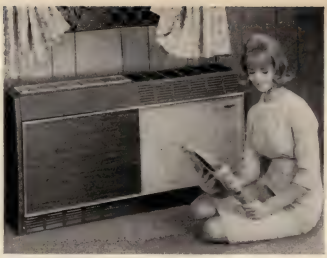
The Educasting system, which employs combined television and FM station operation, was conceived by TuTorTape Laboratories. Programming of the course was done by International Correspondence Schools.

Wood Chewer and Floating Mower Are Builders' Tools

Building homes in Florida can call for some ingenious machines. For example, a boat-mounted mower (below and bottom left) clears fast-growing weeds from lakes in the Mackle Brothers' Deltona retirement community. The rig, built by the construction firm, has a farm-type mower run by a concrete mixer engine. The Iron Beaver (bottom right) chews unwanted trees into lawn-base mulch.



***OVEN-SIZE BROILER** eliminates greasy smoke and oven spatter. Adjustable grill, spatter guards and pan of aluminum comprise unit which fits any standard oven. Price: $7.95. By Royal Cookware, Box 7103, Louisville, Kentucky*



***ROOM CONDITIONER** heats or cools at touch of button, operating on household 110-volt current. The 49 by 26 by 11-inch unit houses both a vented gas unit and electric cooler. $379.95 from Sears, Roebuck & Co., Chicago, Illinois*

New for Your Home

***NEW CHAIRS** contoured to fit the body stack so closely that 40 pile just four feet high on a dolly cart, or snap together in rigid rows of six. Built of chrome-plated steel and vinyl-coated formed metal, chairs resist stains, withstand weather and pool-side use. Each weighs 13 pounds, costs $35. By General Fireproofing Co., Youngstown, Ohio*

PORTABLE RULE *works like automatic-rewind tapes, but keeps a permanent record of children's growth. Coated tape retains ball-point marks; shatterproof case holds photo. $2.49 apiece from Lufkin Specialties, Saginaw, Mich.*

WEATHER SPHERE *houses three units: barometer, thermometer and hygrometer. Globe 5 inches across hangs on wall or stands flat. Unit forecasts 24 to 48 hours in advance. Price: $24.75. Edmund Scientific Co., Barrington, N.J.*

FOLDING BED *weighs 3 pounds, folds out to 50 by 26 by 6-inch cot for kids at camp or home. Aluminum frame is sturdy; canvas cover, washable. Striped cover model: $11.95. Goode Products, 7542 Maie Ave., Los Angeles, Calif.*

Electronic Sail Trainer

A fully rigged 12-foot sailing dinghy which electronically simulates sailing conditions has been developed in England.

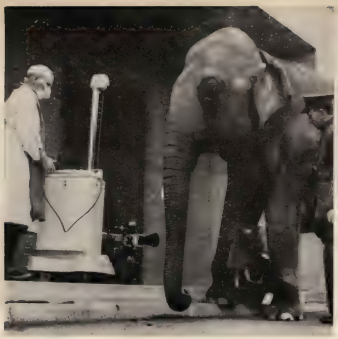
Intended to complement conventional sailing instruction afloat, the "Sail Trainer" helps build confidence by making it possible to repeat maneuvers in slow motion. The instructor can set wind strength and dinghy speed, and also control the angle of list, movement of the boom and the weather helm. Once conditions are set, the pupils can haul the boom, operate the tiller and shift their weight. The unit is made by T.P.I., Ltd., Box 2, Caterham, Surrey, England.

Head Light

Adapted from coal-miner's light, a flashlight on a headband can be used for peering in dark corners, leaving the wearer's hands free. Mounted on a 360-degree swivel base, it can be pointed in any direction. Its battery is rechargeable. $9.95; Puritron Corporation, New Haven, Conn.

Seagoing Catamaran

Offering air-conditioned accommodations for 317 passengers and facilities for transporting 15 automobiles, Japan's first seagoing catamaran designed specially for carrying passengers was recently put into service on the Ondo Strait route connecting the islands of Honshu and Shikoku.



Think Big — and Get the Big Picture

Though robust of health in most respects, elephants are known to have chronic trouble with rheumatism of the leg. The impossible task of arranging hospital accommodations for Jumbo has been solved at the London Zoo by treatment with massive mobile X-ray equipment which is either brought to the animal's own enclosure or set up in the hospital courtyard, resembling an out-patient clinic. An X-ray setup is shown in the photo, above left.

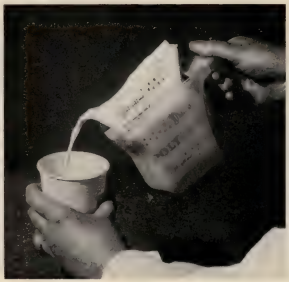
Veterinarians claim that this is the only system which gives them leg room to treat leg rheumatism.

Now the British Are Drinking Milk by the Sackful

Plastic bags have replaced milk bottles on 4000 doorsteps in Suffolk, England. Unbreakable, even if dropped from a table or piled in containers (lower left), the polyethylene bags are designed to relieve both the housewife and the dairy of bottle washing and collecting.

The plastic is sterilized by ultraviolet rays as it runs through the packing machine which fills 180 gallons per hour.

The dairy also provides each customer with a jug which holds the pint-size plastic milk bag and facilitates storing and pouring from the bag (lower right).



Buy a House That's

MARKET FOR USED HOMES like this one holds up year after year despite competition from new houses. Advantages include low taxes, more space for the money and locations in well established neighborhoods with many conveniences

SMALL FOUNDATION CRACKS like this one are usually harmless. But if numerous, or much wider than this hairline, they could mean a settling foundation

PEELING PAINT on this exterior window sill was caused by termites, even though sill was 4 feet above ground. Insects tunneled up between bricks

Structurally Sound

BINDING OF WINDOWS might be caused by build-up of paint on sash—but another reason might be that frame is out of parallel due to foundation settlement

EVERY NOW AND THEN a house won't have a clean-out trap on the waste plumbing system. Always check for one, and make sure it's conveniently located

Is that old house a bargain or a white elephant? Here are some tips that will help you find out —before you put down your cash

By Arthur J. Maher

WHEN THE SMITHS moved into their frame house in Queens, N.Y., they congratulated each other on finding a bargain.

After more than a year of looking, they'd found a two-story model with three bedrooms, large dining and living rooms, full basement, big eat-in kitchen, enclosed sun porch, ample storage space and a two-car garage—all for $17,000—a modest sum in New York City's home market.

"We'd have liked a new home," recalls Mrs. Smith, "but in our price range that would have meant going so far out in the suburbs that commuting expenses would have killed us. Also, we'd have had to settle for a smaller house."

"We pay less than half the taxes a friend pays on his smaller suburban house," Mr. Smith adds. "What's more, our schools, sewers and sidewalks are already in. No future assessments to pay for them."

The Smiths, of course, are far from unique. Every year, at least twice as many Americans buy used homes as buy new ones, largely for reasons like the Smiths'. They go shopping for a used-home bargain, plunk down their cash and move in. With a contented sigh, they start paying off a reasonable mortgage. A rosy picture, indeed. Any pitfalls? You bet.

The man who buys in August may find, come winter, that his heating bill is astronomical. Or, when installing a washing machine, he may find that the first turn of a wrench breaks a long section of pipe, creating a $100 plumbing job. Or, when he moves a piano into the living room, the floor may start to sag.

For, although buying a house is the largest financial transaction of most people's lives, few persons really examine a house they intend to buy. Result: The used-home buyer, after saving a bundle, often winds up spending that bundle on

a variety of costly unexpected repairs.

Arthur Tauscher, a New York consulting engineer who heads a five-city group of house inspectors, has compiled the following figures which indicate how much money one can expect to pay out for repairs:

Age of House	Probable Cost of Repairs Needed
2-8 yrs.	$ 350-$ 700
8-15 yrs.	750- 1500
15-30 yrs.	1500- 3000

These figures were based on over 5000 home inspections, and do not include houses that were poorly maintained, or which had such serious structural flaws as a sinking foundation. They also do not include the cost of interior or exterior painting. They show that, if you buy an older home, you should make sure there's enough cushion in your budget to handle the repairs.

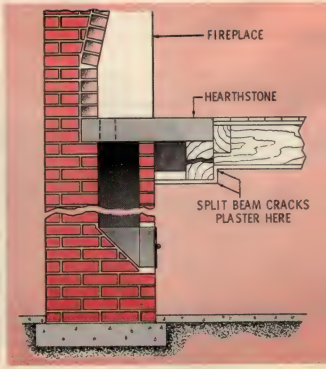
One couple paid $3000 less than the going rate in their neighborhood for a 40-year-old home. They didn't know that the speculator they bought it from had obtained it for a song because of its "rundown" condition. The only "renovating" he'd done was to slap a white water-soluble coating—probably calcimine—on the interior. When the couple went to redecorate, no paint would take until all interior walls were scraped and washed—a back-breaking job. Shortly afterward, the porch structure was found to be so rotten it had to be ripped off and an entirely new one built. The couple's "bargain" was a white elephant.

So, when you buy a second-hand house, don't just walk through, while the agent points out the lovely kitchen or the big closets (which your wife would notice anyway). Look for anything that will mean additional cost after you move in. Then add that cost to the house price. Or point it out to the owner; he may deduct it from his price.

Take an exceptionally close look at all wood members—studs, plates, sill, grade beam, ceiling and floor joists and rafters—which are visible in the attic and basement. A flashlight will come in handy here. Look for:

Splitting: Some checking or cracking—especially in heavy timbers—is normal. Don't worry about small surface splits which are created as the wood dries out and shrinks. Look for large splits. One or two of these on a couple of joists still are not serious, but if you see many of them, or if the girder or main beam (which usually runs down the center of the base-

IF JOISTS AND BEAMS have been finished over, cracks in the finishing materials indicate beam or joist may have moved. Here, cracks in plaster on basement ceiling were caused by splitting of beam supporting massive hearthstone

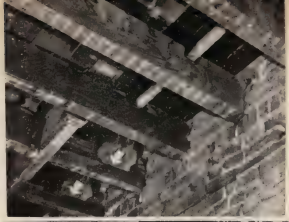


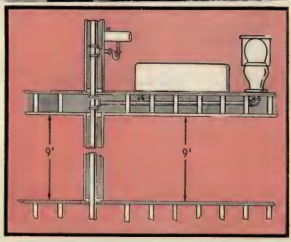
ment) is split, the damaged members will have to be reinforced or replaced.

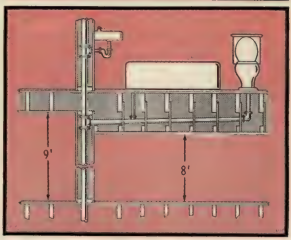
Decay will take the form of either dry rot (the wood has begun to crack, powder and crumble) or damp rot (the wood seems pulpy, and is also accompanied by splitting and cracking). If you see either type of decay, rap the wood with a knuckle. A hollow sound means the condition may be extensive.

To correct either type of decay, you'd have to reinforce or replace the affected members. However, with damp rot you must also eliminate the source of moisture, which might involve waterproofing the basement walls or installing foundation vents. In an attic, it might involve installation of eave, gable and/or ridge vents. Or it could mean repairing the roof.

Termites are most often found in wood —such as the sill—that is close to the ground or rests on a masonry wall. Their presence is often accompanied by damp rot. Unfortunately termites work inside the wood. Therefore, unless a previous searcher has cut into the infested member, revealing its honeycombed or hollowed-out interior, the only signs you might see are the shelter tubes which the insects build to cross over masonry surfaces and bypass termite shields. Finding even one such tube





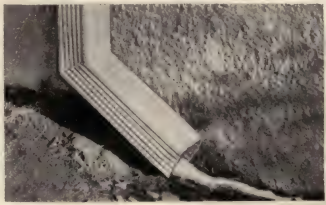


IN BRONWSTONE HOUSES, ceiling height below upper-floor bathroom should be less than in adjoining rooms (bottom drawing). Otherwise, joists were probably notched for waste lines, as in photos and drawing at top. Check for floor sag, ceiling cracks

IN BATHTUB OR SHOWER AREA, loose ceramic tiles should be fixed at once, as they let water into walls. Loose tile will move when pushed with heel of hand

DON'T DO IT: Avoid the commonly recommended practice of jabbing wood for proof of termite invasion. A pierced pipe, wire, etc. could bring a lawsuit

CRACKS OVER WINDOWS in masonry wall could mean the foundation is settling. Check for large cracks in foundation wall and in interior walls near windows



DOWNSPOUT DRAINING near foundation wall gives water a shortcut to the basement, especially if land is not properly graded to carry water away from house

means trouble lies ahead for someone.

A serious termite invasion can cost thousands of dollars. But never panic at the first sign of a termite. A house in the New York area was recently sold for thousands less than it was worth because word got around that it was termite infested. An engineer realized the damage was actually slight, bought the house, spent a few hundred on repairs and pocketed a healthy saving. So, before you pass up an otherwise good house, get an estimate from a termite inspector.

Notches: In older homes, some floor joists may have been notched to accommodate plumbing or wiring. These generally cause no trouble unless the notches are very deep or very numerous. Repairing them may involve little more than beefing up the notched members. But such damage *may* sometimes be severe. An urban row house tells a story that was quite different. When a remodeler tore off the old plaster, he found several joists so deeply notched as to be virtually useless. Result: $1500 added to the bill. The house originally had no plumbing wall. Some owner had installed a bathroom on the third floor, and, in order to run the fixture drains to the waste stack, had cut away parts of the second floor joists. Elsewhere in the same house, a stout beam had failed under the weight of a massive hearthstone. In both cases, some detective work on the buyer's part (see photos and drawings, pages 112-113) would have tipped him off to possible trouble.

Settlement: A certain amount of this is normal in every house, so don't be alarmed unless it is excessive. As you walk through each room, watch for large cracks in the wall finish, especially any that seem to have been patched repeatedly. Also, try windows and doors. Serious binding indicates frames are probably out of parallel—unless, as often happens with old windows—a careless workman has painted them shut. A sign of bad settlement is a gap between the baseboard molding and the floor.

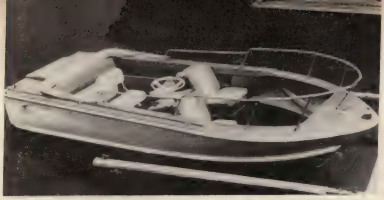
(Please turn to page 194)

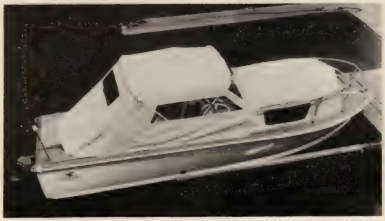
Canvas Cover-Up

Utilizing add-on canvas units, Duratech's new 16-foot, 9-inch aluminum Sportboat offers a three-stage conversion from an open runabout for skiing or fishing to a completely enclosed camper-cruiser.

Starting with the open version, you can add a bow shelter ($125), Navy top and side curtains ($150), vinyl windshield ($15) and stern curtain ($60).

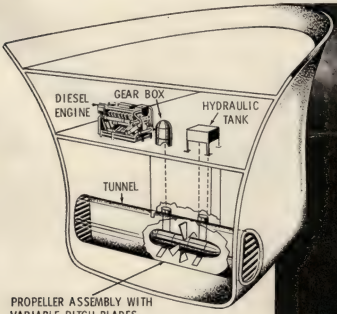
The 575-pound boat is rated for outboards up to 85 hp and has a beam of 6 feet, 7 inches. It's produced by Duratech Aluminum Boats, Penn Yan, N.Y., and all prices are f.o.b. the manufacturer.

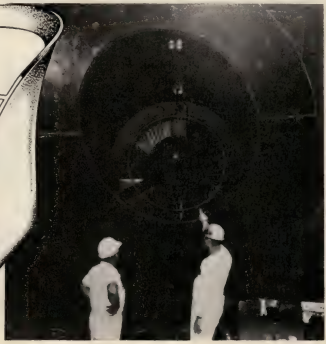




Hole in Ship's Hull Holds a Built-In Tugboat

How can you make a 628-foot tanker turn on a dime? One way is to install a six-and-a-half-foot-diameter tunnel across the bow section and mount a variable-pitch propeller inside. The *Esso Bangor*, owned by Humble Oil and Refining Co., is saving 25 percent in port cost through reduced tug charges and docking time with the aid of just such an installation. Called the "bow thruster," it pushes a jet of water through the tunnel in either direction, moving the bow closer to or away from the dock. The big four-bladed prop is powered by an 800-hp diesel engine and exerts 20,400 pounds of thrust. It's controlled from the bridge.





What's New for the Outdoors?

More Luxury for Campers

Folding motels, portable TV, kerosene irons and gas heaters—this is called roughing it!

By Stuart James
PM Outdoors Editor

IN A DAY when camping was reserved for the rugged individualist, the famous quartet of Harvey Firestone, Henry Ford, John Burroughs and Thomas A. Edison made headlines by camping in comfort and style.

They traveled in a caravan of several cars, with a truck to carry the tents and equipment. They also had a cook and helper, drivers, men to set up the camp, and guards to keep away curious onlookers. Edison often complained that he had to slip away for a chance to think, because the camp was so crowded.

This foursome had no idea what they were starting. A recent survey estimates that there were 16 million people camping in the U.S. in 1964. One thing they seem to have had in common was a desire to take all the comforts of home with them.

Last summer, for example, I camped in a public area at Lake Tahoe, Calif., with what I thought was the epitome of luxury: an Apache tent trailer with a Land-Rover to pull it, a complete line of Coleman equipment, and a full set of aluminum cookware. Being a dedicated backpacker, I was embarrassed by this wealth of equipment—until a couple from Spokane, Wash., rolled into the site next to mine.

What they removed from their loaded station wagon was astonishing, and when they were completely set up I took a notebook and paid a call on the compleat

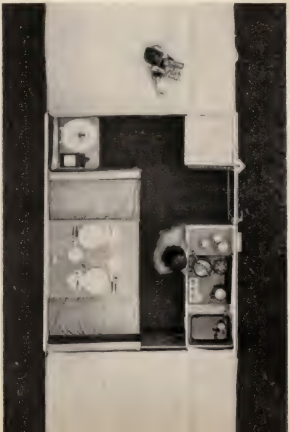
TENT TRAILERS are beginning to look like folding mobile homes. This luxury model by Starcraft is 18 feet long when opened and sleeps eight. The trailer cover raises to form a canopy, allowing headroom throughout the interior

UTILIZING DETACHABLE upper bunks and double-deck folding cots, the Nimrod Riviera will sleep a total of 12 people. They also offer a folding sink and work table, and an ice box as optional equipment with their larger Americana model

NEWEST ENTRY in the field is the Crusader, a tent trailer that unfolds into two rooms, with upper and lower double beds, and a dinette that becomes a bed. Kitchen unit, wardrobe and heating unit are offered as optional equipment

INTERIOR OF THE STARMASTER has two dinettes that convert to double beds, a gas range, ice box and a sink with a hand pump and a 20-gallon water tank

APACHE'S GOLDEN BUFFALO is a rolling motel, with two slide-out double beds, a dinette that becomes a bed, a gas stove and sink, and a chemical toilet



TRANSPORTATION around the camp ground is afforded by an Italian folding bicycle that is carried in a zippered case and can be assembled in 30 seconds

PROPANE STOVE by Frontier Fabricators cooks, grills, toasts, bakes, heats five gallons of water, and has attachment that converts it to a camp lantern

campers, as they might be called.

There was an 18½ by 9½-foot Wenzel umbrella tent that was divided into three rooms. It was supported by an exterior aluminum framework, eliminating guy ropes and any inside poles. For privacy in the public campground, they had erected a six-foot wall of canvas on guyed aluminum poles to make a 12-foot-square enclosure around the front of the tent. Inside the tent were two aluminum-frame folding cots that could be fitted as double bunks, and down-filled sleeping bags. Earlier, I had watched them fill their air mattresses with a device called an Exhaust Inflator, a small pump activated by a car exhaust but which pumps clean air.

In the enclosure before the tent were two folding camp chairs and a chaise longue of canvas and aluminum that folds flat for stowing. Their dining table and benches were a single folding unit that would seat four adults comfortably and was the size of a narrow suitcase closed.

A Humphrey two-burner stove, two outside lamps mounted on stakes that can be pushed into the ground, a hanging lamp for inside the tent, and a large Escort portable refrigerator were all operated off a 20-pound LP gas cylinder. For charcoal broiling they had a "Piccolino," a full-size rotisserie with a grill and hand-operated spit that folds into a case about the size of a cigar box.

For heating the tent when they camped at higher altitudes there was a handsome little Therm'x Adventurer, a flameless heater that delivers 3000 B.T.U. for 20 hours on a tank of white gas or naphtha.

Portable Electricity

Despite the luxury, all this equipment still smacked of the outdoors—with two exceptions. When I arrived the couple was watching the news on television, and coffee was perking in an electric coffee

POCKET-SIZE folding stove available from Abercrombie & Fitch burns Heat-Tabs, a wafer-like fuel that produces enough heat for coffee or a complete meal

FAMOUS FOR THEIR MOUNTAIN STOVE, Primus of Sweden has entered the luxury market with handsome two-burner propane stoves imported by Therm'x Corp.

IDEAL FOR EMERGENCY LIGHT is a candle lantern from Trailwise of Berkeley, Calif. It is aluminum with mica windows and is 4½ inches long when folded

pot. It took a moment to recover from surprise and trace the electric wires to a 40-pound gasoline-driven Niagara alternator that hummed quietly in a corner of the compound, giving off a steady 900 watts of power.

This camp seemed unusual at the time, but after a month of visiting campgrounds in California and Nevada, watching women spruce up with electric hair dryers and press clothes with a kerosene iron, seeing reading lamps and hot water heaters that operate off an automobile cigar lighter, and listening to a mother call her children to dinner with a Tele-Mate, a two-way walkie-talkie with a three-mile range, I could only think of the impossible task of the State Department information service. If they can't convince Iron Curtain peoples about the living standard of the average American at home, just wait until they try to explain how he goes about "roughing it."

And the trend toward luxury in the out-

PRO-BA-CHI is a flameless broiler for steaks or burgers. It operates off standard propane bottle, and stands on end to keep drippings off heat unit

MANTLE LANTERN made by Knapp-Monarch gives light equal to 100-watt bulb. It is simple to operate and utilizes cans of butane fuel under pressure

TAKING THE HUFF AND PUFF out of inflating an air mattress, an inexpensive rubber air pump from Abercrombie & Fitch is easily activated by the foot

SMALLEST TENT TRAILER is the Holsclaw, a utility trailer with a double-deck sleeper top that provides ample room for three children and two adults

doors continues, explained by a statistic from a recent national survey indicating that one out of three campers in the U.S. is a woman, and just as it is her natural inclination to curtain and carpet a fishing shanty into a vacation retreat, she is determinedly civilizing the campsite—with equipment manufacturers eager to help.

While there is nothing startlingly new in camping equipment this year there are innovations in the old for greater comfort and convenience.

Tent trailers are expanding, offering additional sleeping room, and built-in dining areas, stoves and ice boxes. Wayfarer has put large screened windows all around one side of the tent for a "cottage" look in their Mark 5 model, and added fittings to accommodate three optional upper bunks above the pull-out beds. Nimrod is offering a sink and work counter that folds away for traveling and pulls up for use. It is optional equipment with their Americana model. Besides dinette, sink, stove and ice box, the Apache Golden Buffalo has an LP floor heater and a chemical toilet. The dinette converts into a third double bunk, and the travel cover raises straight up to become the ceiling, eliminating the slope of the "tent."

Electricity can be carried anywhere with the Tiny Tiger, a 12-pound gas-powered generating plant for 12-volt equipment that is only ten inches long and seven inches wide.

The Camp'otel car-top camper features an outside stall shower. A five-gallon tank

(Please turn to page 190)

Boating Cookery

Fix a meal in foil before sailing, and they'll call you chef the first time out

By Patrick Perrett

AS A SAILOR, you may possibly be inclined to run your boat aground, or foul anchors, or even lose things overboard.

But at mealtime (if you've managed at least to stay afloat) you can make your guests believe that your 16-footer is the *Queen Mary* when you magically produce piping hot—and appetizing—meals.

Imagine how a hot pork chop stew will impress your crew when they're really expecting things like hardtack, salt pork, or—at best—peanut butter and

WITH APPETITES WHETTED by the outdoors, even the youngsters will pitch in and cook. This lad is using a disposable charcoal brazier

jelly sandwiches. Here's how to do it:

At home you can prepare the stew in complete individual meals by wrapping in aluminum foil a medium-thick pork chop with onions, potatoes, carrots and other vegetables.

Then, about 45 minutes to an hour before your mealtime in the boat, place the wrapped packages on the grill of a charcoal burner. The moisture that remains after you washed the vegetables (don't forget to do *that*) is sufficient for steaming the contents of each package. Be sure to turn the foil packs frequently to avoid burning the vegetables. Then pass the individual packages around for the feast.

One tip: Be sure the foil package is completely sealed when you prepare the stew. Do this by double wrapping with two pieces of foil. You can use the same technique for vegetable dishes.

That universal favorite, the hamburger, can be prepared in advance, too. You can add your own individual touch by mixing ground round with pepper, garlic or hickory smoked salt, catchup, minced onions and a pinch of oregano. Form patties, insert wax paper between them, and wrap in foil. These packets can be frozen at home and stored in an ice chest in the boat. They'll keep for at least two days this way.

Obviously, you'll need more preparation for a boat meal than the two dishes just mentioned. And just as obviously, you won't want to take up valuable space in a 14 to 16-foot boat with a box of randomly selected groceries that's still half full (and occupying space) on your return trip.

So the first thing to do is make up a list of all meals plus menus for each. Buy the groceries, and prepackage and label the meals. Pack the imperishables in a can that is labeled for the meal at which they'll be used. The produce and perishables for each meal are packed in plastic bags, labeled and stored in an ice chest—with the last meal on the bottom.

During your planning, you've got to assume that when you're on the water all those who aren't seasick will have formidable appetites. So add some between-meal snacks, like fruit, raisins and cookies.

On a one-day outing, you can probably pack everything in a box or in an ice chest with the cold drinks. Even the dry, crisp things, when sealed in plastic bags, will stay that way in the cooler.

And you can just about double the capacity of an ice chest by freezing food, water and beverages at home and using them in place of ice.

For several days of meals, you can sometimes plan to use one item for several meals. A canned ham, for instance, cut into thick slices can provide a hearty mainstay for dinner. The next day the remainder can be diced to add interest to morning scrambled eggs or sliced to provide delicious luncheon sandwiches.

Other space-savers among foods are the freeze-dried ones. You can buy complete meals prepared this way. Individual dishes available, to mention a few, are noodles Romanoff, several forms of potatoes (mashed, scalloped, hash brown, sliced, fried), ham omelettes, all types of soups, gravies and sauces.

MOTOR SHROUD for stern drive offers handy surface for cooking; auto floor mat keeps grill from skidding. Homemade table folds out of way on hinges

SHELF alongside motor well was made by an "old pro" boating chef to hold charcoal grill. Baked potatoes are being kept warm while pork chop stew cooks

Most of the dried foods call for water. When milk is required, powdered milk is adequate and excellent with sauces.

How to Cook Aboard

But back to impressing your guests by cooking that piping-hot meal. You may prefer to go ashore to cook—and admittedly it's safer and easier that way—but every good seaman should be ready, willing and able to fix a meal while his boat is swinging from an anchor.

The most widely accepted stove for marine use—from the standpoint of safety—is the alcohol stove. It will not produce the amount of heat generated by most camp stoves, but an alcohol fire can be extinguished with water. Canned heat also provides a safe cooking fire. Kerosene stoves are safe, but many people object to their odor.

Gasoline stoves using white leaded gasoline—the most widely used of all camp stoves—are not recommended as permanent stoves aboard any size boat. While completely safe ashore, where any escaping gas fumes (which are heavier than air) are dissipated along the ground, caution must be exercised if they are used aboard an open boat. If you must use a gasoline stove, place it as high above the deck as possible so it can be dumped overboard quickly if necessary. Butane and propane stoves also use gas that has heavier-than-air fumes which tend to gather in the bottom of the boat if there's any gas leakage.

Charcoal braziers are as good in a boat

SOLID-FUEL STOVE is especially designed for marine use. It's made of stainless steel, and guard rails hold utensils in place even if boat is in rough water

JAPANESE HIBACHI is a bit on the heavy side, but is an efficient stove. You'll need only a relatively few pieces of charcoal to cook an entire meal afloat

EGG CARTONS are handy-sized containers for charcoal. You can use one carton of charcoal per meal, and start each fire simply by setting the carton afire

CHARCOAL BRAZIER that was designed for boat use is inserted into special metal fitting on the deck of the boat. It can also be carried ashore for use

SINGLE-BURNER STOVE is compact, taking up little boat space. Aluminum pot is part of carrying case for stove; lid of pan serves as cover or frying pan

ALUMINUM STAND to hold the stove is a real backsaver for the cook when you go ashore for meals. It's lightweight and folds away for storage in boat

PORTABLE CUPBOARD was designed by boat camper for on-shore use. To build one, first assemble all the items you wish to store and mock it up in cardboard

as they are on the patio. In addition to the Japanese hibachi, there are many lightweight aluminum and steel models. Some are designed to extend overboard to keep the fire entirely out of the boat.

Dishes and utensils should be planned carefully to eliminate unnecessary items. Minimum needs for an overnight trip include: pancake turner, slotted spoon, long-handled fork, two paring knives, carving knife, can opener and ice-pick. Plastic or paper cups, plates and flatware reduce galley chores and conserve fresh water.

A nesting aluminum cooking kit will supply all the utensils required for a full meal, and they take up little space. Frying pans lined with Teflon are ideal, since they require no grease for cooking, and they can be washed in cold water. A cast aluminum frying pan that is divided into three parts and lined with Teflon allows you to cook a complete breakfast at one time. This pan has all the advantages of cast iron, but is lightweight.

When you're carrying canned food and want it heated, one method often used is to place the cans in a net bag and drape them close to the motor's exhaust.

Among pieces of equipment, an efficient ice chest is a must. Best for boat use are those made of aluminum or Styrofoam. Both are lightweight and won't rust. (See *Coolers for Campers* on opposite page.)

Another handy bit of equipment for a small boater is a cupboard for food storage that he can build himself. Use marine plywood, and design it to fit your boat's cockpit arrangement. Rope handles will make it easier to move the box.

Sometimes such a box gives you your only flat surface to use as a counter during food preparation. Those who prefer to go ashore for cooking might want to build a cupboard with detachable legs, like that pictured at the left.

The most difficult meal to prepare on a long trip, whether it is tent camping or boating, is the first meal of the first day. The confusion of embarking, the lack of organized routine, just the chore of getting supplies and equipment in order, all contribute to making this first meal a culinary chaos. The wise thing is to eliminate it entirely by packing a separate picnic lunch that will require no cooking. This breathing space will give you time to adjust to new surroundings. The rest of the meals will come off like clockwork. ★★★

The Coolest

Coolers for Campers?

Throw away ice chests with the paper plates? Or are permanent ones more sensible? We tested all kinds and even tried them in Death Valley

"YOU HAVE TO THINK of an ice chest in the same way you think about paper plates. You don't expect paper plates to last forever, so why be concerned about the durability of an ice chest that costs only $3—which is not much more expensive than the ice you put into it? You use the chest for one trip and throw it away. What does it matter how strong it is?"

This was the sales pitch I heard from the manufacturer of a molded polystyrene ice chest, and it happens to be a growing idea among a lot of campers.

On the other side of the coin, a *PM* staffer took one of those inexpensive styrofoam coolers on a boating trip, and while he was loading the boat he tripped, dropped the cooler, and it split in half. After a day on the water with warm refreshments, he was less than enthusiastic about the savings involved.

And in answer to the "throw-away theory," the maker of a steel and plastic ice chest said, "In the long run it will be quite expensive. If you use just four in one full season, they will cost you about $12. In three years the cost will be considerably more than the price of one

CAMP COOLERS range in size, price and materials, but their basic job is the same—to keep ice from melting for as long as possible

FOR DROP TEST of plain expanded polystyrene cooler we loaded it with 25 pounds of ice and 15 pounds of food and let it fall from a height of six feet

WHEN IT HIT the floor it literally came apart, the sides and bottom splitting from end to end. This type cooler is cheap, but is very prone to disaster

CAPACITY of average-size polystyrene model (left) and higher-priced, steel-encased Coleman. With 25 pounds of ice in each, the Coleman held the food shown before it in addition to all that standing before the Styrofoam cooler

PLASTIC-COVERED polystyrene cooler that sells for $14 proved remarkably strong, surviving drop test and easily supporting the weight of a 230-pound man

CUTAWAY of new Thermos cooler shows the two thin layers of plastic that form a strong, rust-proof covering for the one inch of urethane insulation

PLACING 25-POUND chunks of ice in four different type coolers, we sealed coolers for three days. Only the $3 Styrofoam chest contained ice when opened

good chest that will last the camping family a full generation."

There are, basically, four types of ice chests, and they have in common the fact that each one is simply an insulated box for holding a block of ice.

The molded expandable polystyrene box is the least expensive. However it also lacks durability. As a test of the strength of this type of box we filled one with 25 pounds of ice and 15 pounds of food, and let it drop from a height of six feet. When it hit the floor it literally exploded, the sides and bottom splitting from end to end.

A second type has a coating of plastic over the polystyrene base and a plastic insert for the interior. This raises the price to about $14, but we put one of this type, a Carrylite, through more than ordinary punishment and it proved to be remarkably tough. We threw it across a room and bounced it off a wall, and kicked it down a flight of stairs. We filled it with ice and food and dropped it, and then we had a 230-pound man stand on the lid. After all this it was only slightly scuffed.

One make of chest, the Weberlite Go-Kooler "30," falls in between these two types. The sides and top are covered with a thin sheeting of steel and it sells for about $5. It is more durable than the unprotected polystyrene, but it will break when dropped and severe punishment dents the metal.

The third type features a heavier and more durable plastic cover inside and out, and metal hinges and latch for the lid. You are now getting into the $20 price range. We tested a Thermos and a Ted Williams model from Sears. They were both extremely sturdy, surviving the drop test and tumbling down stairs without damage. By banging them hard against a sharp-edged object, however, we were able to penetrate the plastic outer skin.

This last test was in line with a criticism often leveled against the more expensive coolers to the effect that a puncture will render them useless and the owner will be out a considerable sum of money. This was not the case. We used the Ted Williams chest after puncturing the side and there was no noticeable loss of insulation.

The fourth type is the metal chest, a steel or aluminum box, about an inch thickness of an expanded polystyrene insulation such as Styrofoam and a plastic

(Please turn to page 203)

WITHOUT POLES OR STAKES, the two-man mountain tent fashioned from a surplus military parachute withstands the wind and cold high in California's Sierra Nevadas. It is suspended between trees, and rocks hold down corners

Custom Tents from Parachutes

Spend just two hours and $9—and wind up with a mountain tent. It's as easy as sewing a curtain

By Robert Talley

WITH ONLY A MARKING PENCIL, yardstick, scissors, minimum ability with a sewing machine and one full evening of time, you can turn a surplus parachute into a pair of two-man nylon mountain tents that weigh less than two pounds each and will fold into a package the size of a loaf of bread.

A standard 25-foot military parachute is ideal for the job. We bought one in mint condition for $18, and to our surprise and delight we learned that the seams sewn in to hold the lines created the tapered panels of exactly the size required for the tent. And an added bonus was chute cord, more than enough top-quality nylon line for the tent ropes.

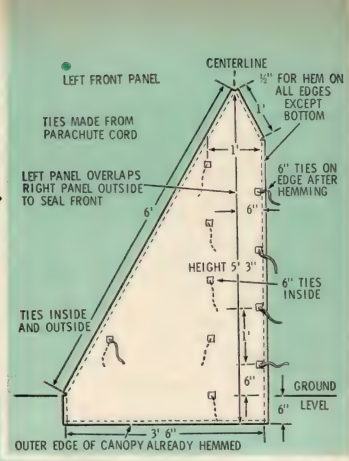
As a double-check in selecting a chute for size, measure along the outside edge of the canopy. It should be about three feet between the seams. You then measure along the seam toward the center, and at a point eight feet from the outside the panels should measure about 23 inches from seam to seam.

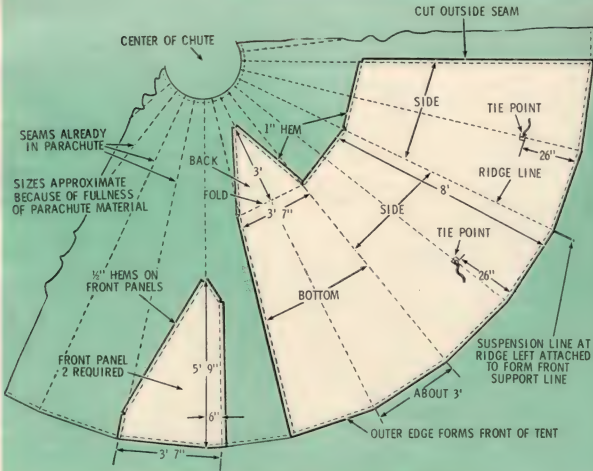
Spreading the canopy on the floor, select six panels for the body of the tent and mark them off as shown in the large diagram at the right, making certain to leave an inch beyond the outside seams for a sewing edge. The next step is to remove the lines from the material, with the exception of the ridge line which is left intact. Cut the stitching around the cord at the center air vent. Then, at the outside edge of the canopy, make a small slit in the seam and cut the cord which will be inside. The cord can then be pulled out of the material, and the loose ends are trimmed close to the outer edge. The side in which the slits are made becomes the inside of the tent.

Double-check your measurements, noting that the back panel is left attached to the bottom, and then cut out the body of the tent. Sew the left side of the tent to

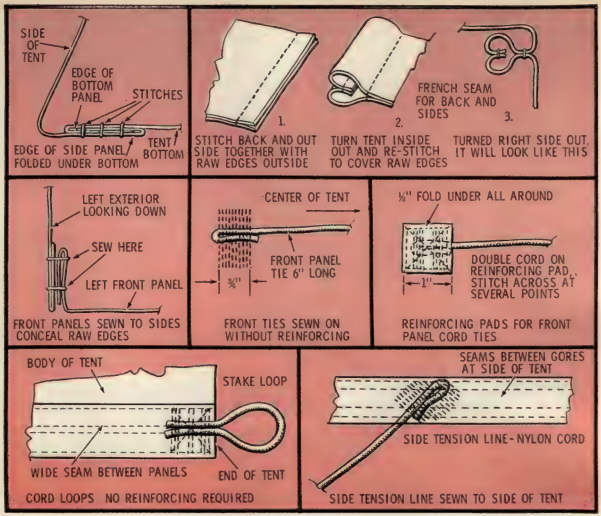
TWO FRONT PANELS are cut from the same pattern. The right side is attached first so the flap of the left will overlap. Each side has 11 tie lines. The dotted lines indicate ties are inside the tent

PARACHUTE CANOPY is spread flat and tent dimensions are marked on with crayon, following the natural panels of the chute. Rear panel is left attached to main body of tent and sides are sewn together





HOW TENT IS CUT FROM PARACHUTE



FRENCHED METHOD of stitching is used on seams to give them greater strength. Patches are cut from chute material, hemmed, and sewed to tent to reinforce front tie lines. Cotton or nylon thread can be used for the sewing

the bottom, overlapping the reinforced seam on the left side so that it goes under the seam on the bottom. Since nylon will stretch, all seams must be basted before sewing. Sew the back panel to the sides of tent, using frenched seam (above).

Measure and mark off two front panels as shown on page 129, leaving margins all around for hemming, except at the bottom. After cutting, the vertical edges of the front panels, and both sides of the bottom flap, are hemmed. Each panel is attached to the tent by starting at the lower outside corner and stitching across the ridge line, and down the other side. Each panel extends beyond the ridge line and when both are in place they will overlap. Sew them so that the left overlaps the right.

Twenty-two reinforcing patches are made (see above) and sewn into place, as shown in the front panel diagram. Six-inch tie lines are cut from the extra line and sewed onto the patches.

A 12-inch piece of cord is looped and sewed to the reinforced seam at the four bottom corners for staking down the tent. The side tension lines, about 10 feet long, are sewed on the reinforced seams on each side, 26 inches from the forward edge.

Extra cord is attached to the ridge line so it can be suspended between two trees.

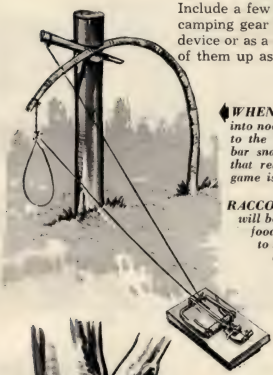
The nylon parachute cloth will resist light rain, but the finished tent should be sprayed with a waterproofing agent against the possibility of nasty weather.

We used two tents of this design on a September pack trip into the Sierra Nevadas. The 14,495-foot summit of Mt. Whitney was our goal, and we made our base camp at 12,000 feet. The nights were extremely cold, but with just an inexpensive plastic ground cloth covering the floor of the tent, we slept—comfortable and warm. On occasion the tents were buffeted by strong winds, and they held up without mishap. ★★★

Going Camping?

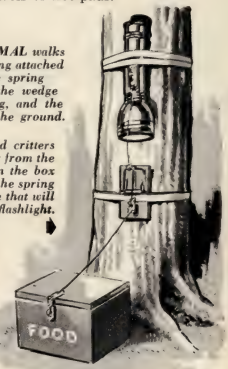
Don't Forget Your Mousetrap

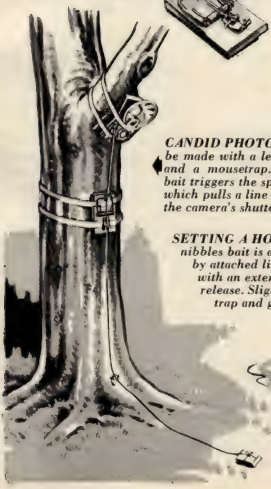
YOU MAY NOT be able to build a better mousetrap, but anyone can make the old model do some unusual things. Include a few (they cost only about 10 cents each) with your camping gear next trip and find uses for them as a triggering device or as a spring clamp. As a starter, you can tack a couple of them up as holders for towels or hot pads.



***WHEN A SMALL ANIMAL** walks into noose, it pulls a string attached to the bait release. The spring bar snaps up, jerking the wedge that releases the sapling, and the game is lifted clear of the ground.*

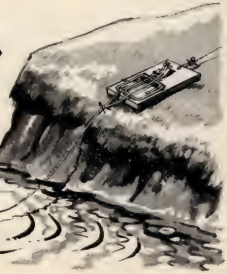
***RACCOONS,** skunks and critters will be frightened away from the food box if line from the box to the trap triggers the spring bar, pulling a line that will switch on a flashlight.*

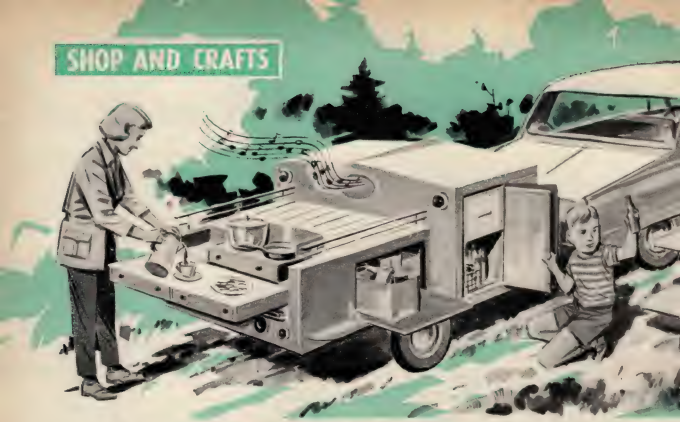




***CANDID PHOTOS** of animals can be made with a lever-type camera and a mousetrap. Tugging the bait triggers the spring bar which pulls a line attached to the camera's shutter release.*

***SETTING A HOOK** when a fish nibbles bait is accomplished by attached line to spring bar with an extension tied to the release. Slightest tug sets off trap and gives line a jerk.*





Roadside Chuck Wagon

By Walter H. Gerber

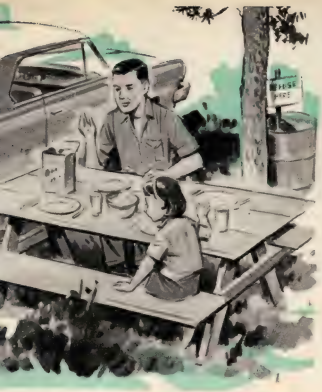
OUR FAMILY can't wait for summer, this year. There'll be a two-week vacation and three long, holiday weekends for open-road exploring. And we've solved the irksome problems that marred our fun *last* season. We've built a carry-all trailer that contradicts that old saw: "You can't take it with you."

Like most U.S. travelers, we're budget-conscious, and we've never seen the point of crowding into a stuffy diner, anyway, when we've a chance to enjoy an outdoor lunch. So we always picked up a few groceries each morning, crammed them into the already-crowded car, and kept watch for those welcome signs (along the highways of most states) that announce: "Roadside Rest Area, 1000 ft." But we weren't the only ones on the lookout, and often, when we reached our lunch site, we found all the tables and fireplaces already in use. Lacking even camp chairs, we'd then end up trying to make sandwiches in the car—and now have red-and-yellow-polka-dot upholstery from the catsup and mustard stains!

Then, too, when we're in National Park country, we enjoy pitching a tent—but not when it means dragging our luggage into the rain to dig out the tent and bedrolls. Also, there *are* times on most trips when you need to dress up to visit friends; but jackets and dresses from a suitcase always looked creased, and trying to keep them on hangers while driving along is rather like wrestling with a tent in a windstorm!

This summer we've taken care of these travel problems in advance. The trailer shown here and detailed on the following pages provides us with a hot-meal kitchen at the flick of a wrist. And there are storage compartments that let us stock up on several days' provisions (including an icebox for perishables), keep our dress clothes hung up, and get at our sleeping gear without unpacking anything else! Though we designed it for a small foreign car, the trailer is guaranteed to take the travail out of travel whatever size car you drive. We even built in a hi-fi speaker for music while we dine. Since long-distance travel keeps your battery charged, it's safe to tie this speaker into a car radio—though for a better selection of good music, we carry a tape-recorder in the car which runs off its own battery.

There's no fuss involved in setting up the kitchen; lifting up and swinging back the hinged leaf opens up the stove pit and creates a work counter with two handy



Meals become a vacation high-point when you take your kitchen along. In this issue we offer two nifty ways to do just that—the kitchen trailer shown here, and a fold-up version (page 139) for the car trunk

1½" X 1½" x 28¼"
JOINT STRIP

SOCKET FOR AERIAL (OPTIONAL)

¾" x 28¼" x 29½"
PLYWOOD (NEED 2)

1" COVE MOLDING

½" x 44¼" x 46½"
PLYWOOD DECK

THREADED RODS

14"

38½"

PARTITION (B)

PARTITIONS (C) (D)

LEFT FRONT SIDE (H)

LEFT REAR SIDE

¾" x 2½"
BRACE

½" x 5" x 42½"
FENDER

¼-ROUND

FRONT (A)

RIGHT FRONT SIDE (G)

END (E)

RIGHT REAR SIDE (F)

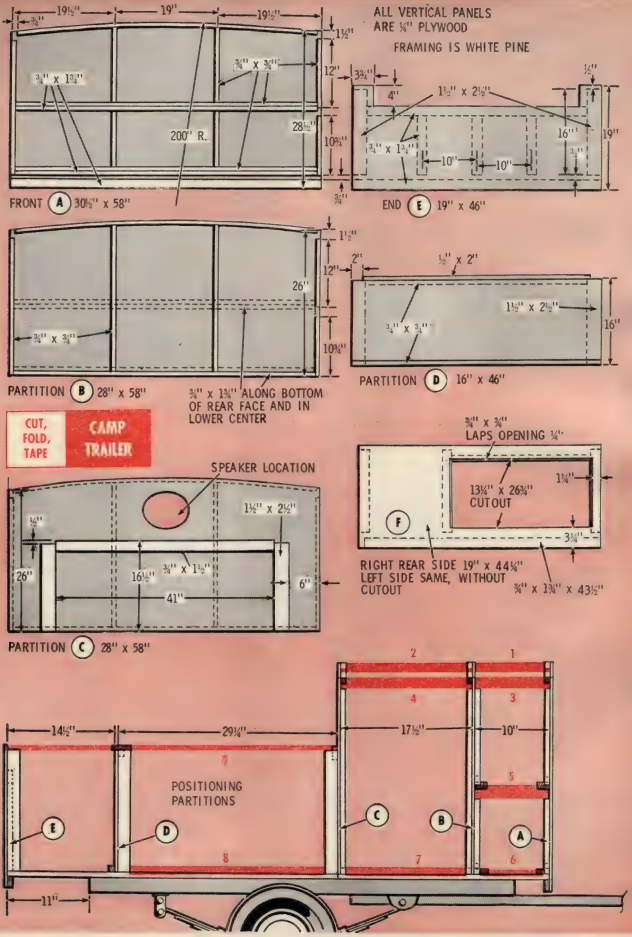
58"

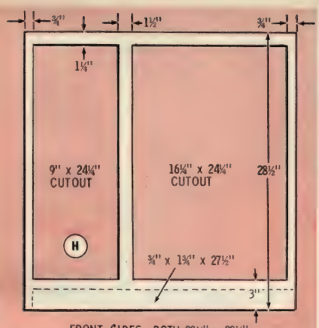
6"

28"

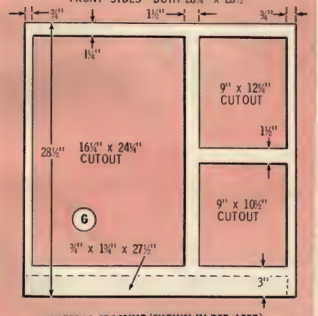
PLATFORM FASTENED TO TRAILER CHASSIS WITH ⅜" x 1½" BOLTS, LARGE WASHERS AND LOCK NUTS

¾" x 46" x 72"
PLYWOOD CENTER PANEL


ALL VERTICAL PANELS ARE ¼" PLYWOOD
FRAMING IS WHITE PINE
FRONT A 30½" x 58"
END E 19" x 46"
PARTITION B 28" x 58"
PARTITION D 16" x 46"
¾" x ¾" ALONG BOTTOM OF REAR FACE AND IN LOWER CENTER
CUT, FOLD, TAPE
CAMP TRAILER
SPEAKER LOCATION
¾" x ¾" LAPS OPENING ¼"
13¾" x 26¾" CUTOUT
RIGHT REAR SIDE 19" x 44¼"
LEFT SIDE SAME, WITHOUT CUTOUT
¾" x 1¾" x 43½"
PARTITION C 28" x 58"
POSITIONING PARTITIONS

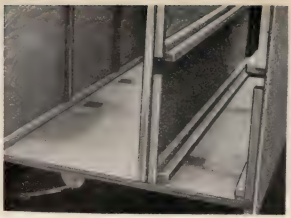


FRONT SIDES – BOTH 28¼" x 28½"

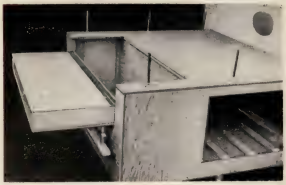


LATERAL FRAMING (SHOWN IN RED, LEFT)

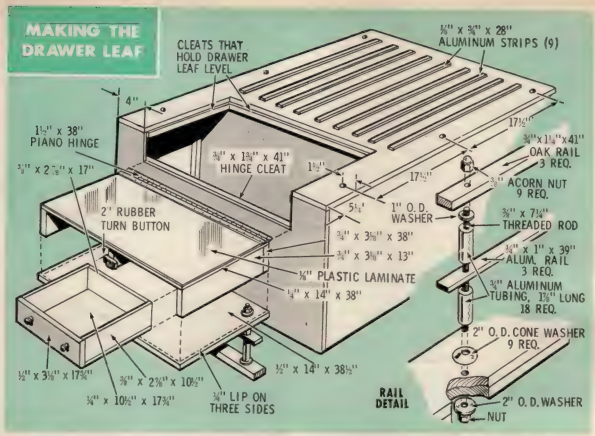
Key	Need	Size (White pine)
1	1	1½" x 1½" x 10"
2	1	1½" x 1½" x 17½"
3	2	¾" x 1¾" x 10"
4	2	¾" x 1¾" x 17½"
5	2	¾" x 1¾" x 10"
6	2	½" x ¾" x 8½"
7	2	¾" x ¾" x 16"
8	1	¾" x ¾" x 26¼"
9	2	½" x 2" x 44"



FRONT PARTITIONS are anchored to bed with screws through framing feet (above); add lateral bracing, then apply side panels with glue and screws (below). Rear deck laps all verticals, ties assembly together



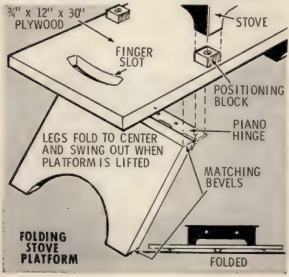
DRAWER LEAF swings back from stove pit, is held level by its own thickness. Water cooler bay (below) is screwed to front. Drop-door rests on tongue to form shelf for setting glass or pan under spigot

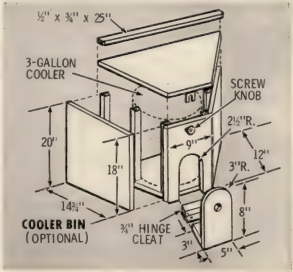


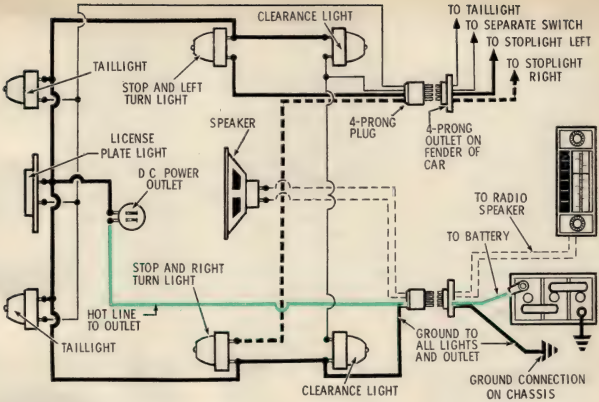
drawers for utensils and paper plates. For cleaning with one wipe of a moist cloth, I covered the work face of this leaf with plastic laminate. You can also plastic-coat the stove platform. The detail below shows how you bring the stove up to working height (our two-burner uses LP gas). When the folding legs are tapped out from under it—by inserting fingers through the grip slots—the platform sinks into the pit, leaving plenty of space around it to pack pots and pans.

To keep the closed drawer leaf from flying up when you sail over a bump, you can tie it down with slide-bolts or turn buttons—although if you lash items to the railed-in deck, this will probably anchor the leaf. We usually tie down several folding chairs there. In a pinch, the leaf's large enough to serve as a snack counter for several people, and these chairs provide comfortable seating.

Access to the other compartment is by means of ½-in. plywood doors—each, of course, provided with a lock to prevent theft when the trailer is parked unattended. In the details provided, there are no lateral partitions, so each compartment runs full width. In the case of the luggage section, in front of the stove pit, access is from one







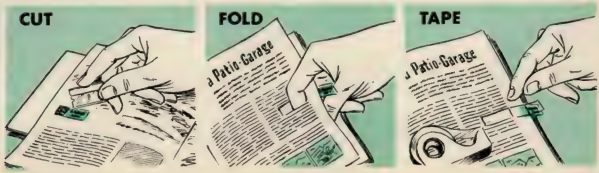
side only. The slats on the floor are to provide clearance of the bolt-heads, and to protect the plywood from wear when sliding heavy luggage, boxes—or even your spare tire—in and out.

In the first (full-height) compartment of the wider front section, the right door opens onto a 25-lb. commercial top-icer—in our case, Coleman's Station Wagon Cooler—held in place by heavy foam-rubber pads at the sides. The left door gives access to the wardrobe closet, where jackets and dresses are on hangers hooked over a clothes rod that bridges the partitions. The "stacked" front compartments are, in our trailer, accessible through two right-hand doors and a single full-height door on the left side. These compartments can be altered to suit whatever you wish to carry in them. And if you don't require a center shelf, you can simplify the framing of panels A and B and use a single door on each side.

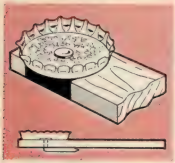
(Please turn to page 200)

HOW TO USE PM's NEW "FILE FLAG" INDEXING SYSTEM

Introduced last month, these fold-out tabs make each issue self-indexing. The first of four such tabs in this issue appears on the story above (see page 134). Such tabs will be "built into" all our major craft and maintenance articles, so that you'll be able to "flag" the ones you want to refer back to, later. Then, if you keep a file of all issues, you'll be able to locate plans or instructions you remember seeing—without that long hunt through a stack of magazines. You tab the pages for quick reference by following the three easy steps shown below. We've located every File Flag so that you'll be cutting away no essential part of the text or plans.

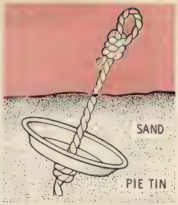


KINKS FOR CAMPERS



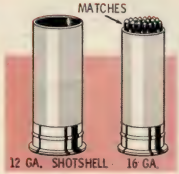
SCALING A FISH without proper tools for the job is easily accomplished by nailing a common bottle cap to a stick about 12 inches long, bending the nail over the back of the stick. This takes only minutes to make, and it works very effectively

WHEN TEMPERATURE drops unexpectedly, you can improvise a heater for your tent by placing a number of medium-size stones in your fire until they get hot, then filling a bucket with the hot stones and turning it upside down inside your tent



PITCHING A TENT on sand or loose ground where regular stakes will not hold is possible with guy lines made from heavy foil pie plates. Punch a hole through the center of pie tin, then pass a line through and knot it at the bottom

FOR MIXING beeswax with turpentine to make a waterproofing agent for your tent, melt wax on a stove, then add it to the turpentine in a bucket standing in a tub of hot water. This will provide enough heat without danger of open flame

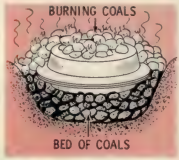


KEEPING A RESERVE of dry matches is a wise move for every camper. A waterproof container that will float can be fashioned from two used shot shells of different sizes, a 16-gauge to hold the matches and a 12-gauge to slip over it as cover

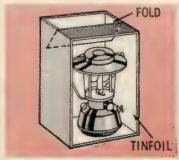
A CAMP TABLE is easily built with dry branches. Drive two stakes about four feet from a large tree, then tie cross pieces to the stakes and attach them to the tree for rigidity. Cross pieces for top can be tied down or merely wedged into place

FIRE STARTERS that burn with intense heat come in handy when firewood is damp. Wrap a kitchen match with yarn, tie it off, and dip it in paraffin. You can make a good supply and carry them in a tobacco tin. Chip the wax off the end to strike

A SMALL, but effective, oven can be improvised by placing two pie tins face to face and burying them in a bed of coals. The space is deep enough for small fish, soda biscuits or bannock, the popular trail bread that rises only a couple of inches



GASOLINE LANTERN and a cardboard carton make an excellent heater. Stand carton on end. Cut half of the top away from the back and fold down to make a deflector. Line inside with aluminum foil. Then merely place the lantern inside the box



"Box Lunch" for the Trail

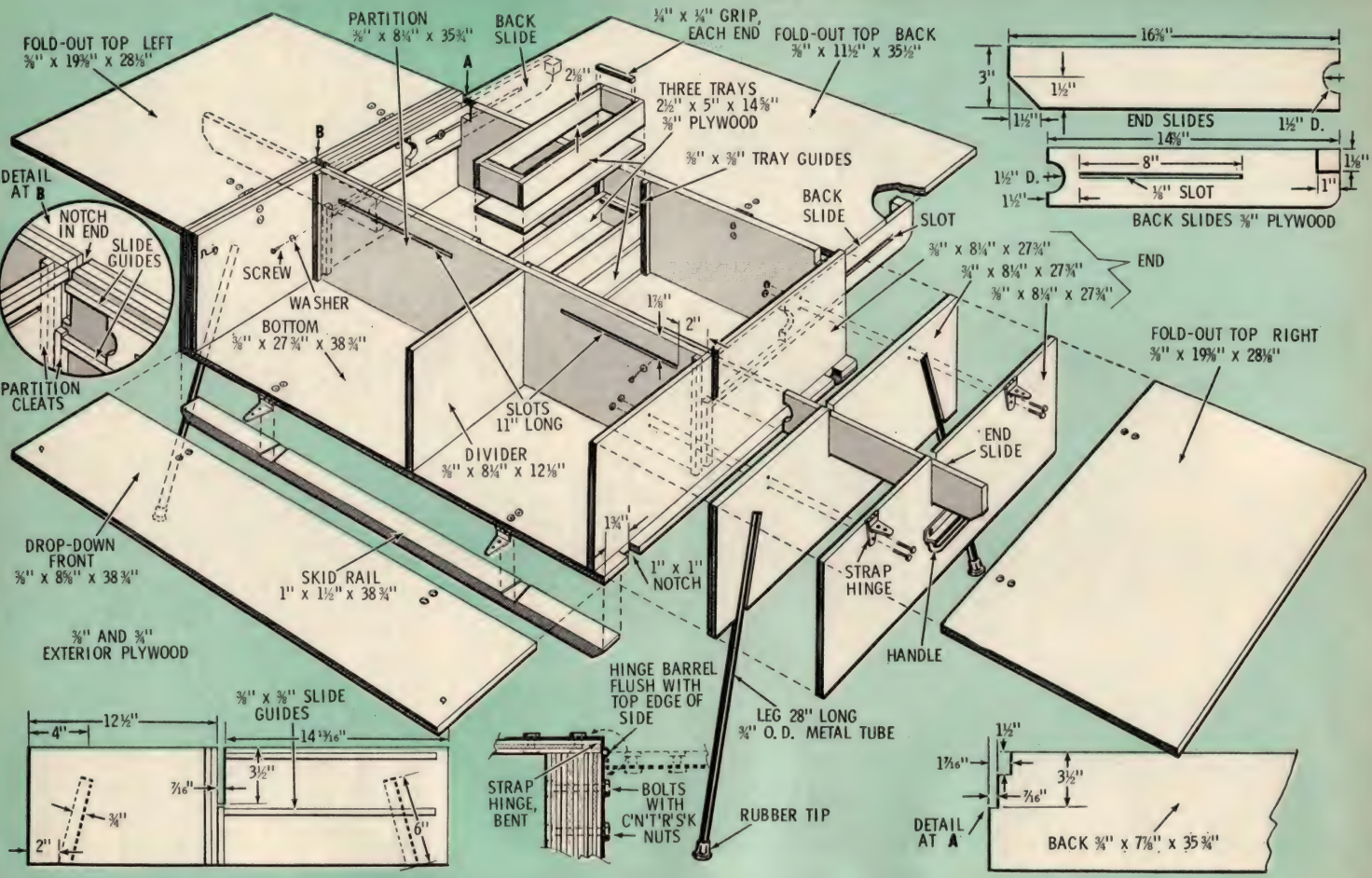
Here's a rig that takes the jagged edge off "roughing it." When you tote this box into the wilds, it spreads its wings into a de luxe camp kitchen and dining table

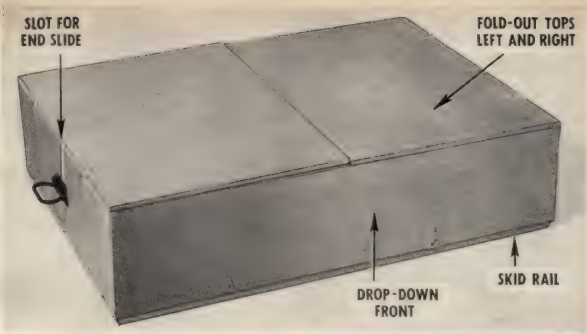
By Steve Ellingson

IF THE SMILES that young couple is wearing, above, are a bit smug, it's because these campers aren't dependent on *anybody* for their alfresco dining. When hunger overtakes them, on the road, they just keep watch for the next attractive spot, pull off, lift a compact box from the back of their car, and carry it between them by means of foot-locker handles. Reaching the chosen site, they insert four pipe legs into sockets, draw out slide supports, fold three hinged leaves onto them, unhook the drop-front—and they've got all facilities for a good, hot meal. There's a camp stove, ready for lighting, surrounded by compartments into which are neatly packed all necessary cooking utensils, a full pantry of packaged foods, and disposable table service. The three table leaves will seat six people (on easy-to-make folding camp stools) and all the groceries are within everyone's reach—without fussy unpacking to carry items to a separate table. And when the dining's done, our travelers simply fold the unit back into a box, slip it off its legs, and tote it to the car—leaving the spot just as unspoiled—and unlittered—as they found it!

And when they hit a campground, that night, they can pick their own site, independent of any cooking or table facilities provided. Any wonder our travelers look smug?

Using the basic dimensions on the following pages, you can adapt the unit to your own needs. The two partitions, for example, should be positioned to keep


FOLD-OUT TOP LEFT
⅜" x 19⅜" x 28⅛"
PARTITION
⅜" x 8¼" x 35¾"
BACK SLIDE
¼" x ¼" GRIP, EACH END
FOLD-OUT TOP BACK
⅜" x 11½" x 35½"
A
2⅛"
THREE TRAYS
2½" x 5" x 14⅝"
⅜" PLYWOOD
⅜" x ⅜" TRAY GUIDES
B
DETAIL AT B
NOTCH IN END
SLIDE GUIDES
PARTITION CLEATS
SCREW
WASHER
BOTTOM
⅜" x 27¾" x 38¾"
BACK SLIDE
SLOT
⅜" x 8¼" x 27¾"
¾" x 8¼" x 27¾"
⅜" x 8¼" x 27¾"
END
1⅞"
2"
SLOTS
11" LONG
DIVIDER
⅜" x 8¼" x 12⅛"
FOLD-OUT TOP RIGHT
⅜" x 19⅜" x 28⅛"
END SLIDE
DROP-DOWN FRONT
⅜" x 8⅝" x 38¾"
SKID RAIL
1" x 1½" x 38¾"
1¾"
1" x 1" NOTCH
STRAP HINGE
HANDLE
⅜" AND ¾" EXTERIOR PLYWOOD
⅜" x ⅜" SLIDE GUIDES
12½"
4"
14 13/16"
3½"
7/16"
¾"
2"
6"
HINGE BARREL FLUSH WITH TOP EDGE OF SIDE
STRAP HINGE, BENT
BOLTS WITH C'N'T'R'S'K NUTS
LEG 28" LONG
¾" O.D. METAL TUBE
RUBBER TIP
16⅜"
3"
1½"
1½"
END SLIDES
1½" D.
14⅝"
8"
1½" D.
⅛" SLOT
1½"
1⅛"
1"
BACK SLIDES ⅜" PLYWOOD
1½"
1 7/16"
3½"
7/16"
DETAIL AT A
BACK ¾" x 7⅛" x 35¾"



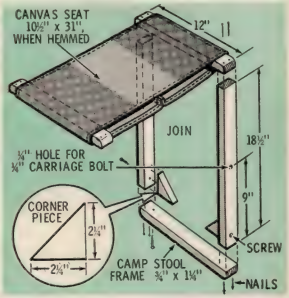
NEAT BOX, 3 ft. long and 9 in. high, results when back flap folds in, front one raises and side leaves close toward each other; box fits most car trunks

your cook stove from shifting or bouncing while you travel. The rear half of the box is divided into two compartments by means of stacked trays, held in place by vertical cleats. These trays hold silverware and small utensils, and are easily lifted out when you set the table up.

Materials costs are kept to a minimum. A panel of ⅜-in. exterior-grade plywood makes most of the parts. You'll need enough ¾-in. ply for the inner layer of the end-panel sandwich that provides leg sockets at each side.

Note that slots which permit the *end* slides to travel are cut in the partition. But since the *back* slides are attached to the thick end panels, their travel-slots are cut in the slides themselves, with the anchor-screw driven into the panel. Those 1-in.-sq. blocks at the ends of the back slides are to provide surer seating for the leaf, since these slides run right along the panel's edges. The notch through which the slides move is widened at the top so these blocks will sink flush with the back of the box (see Detail A).

The two frames of each camp stool are identical, but the second is assembled through the first, like a chain link. Insert the canvas wrong-side out through the finished stool, machine-stitch the seam and then turn right-side out. ★★★



All dimensions and assembly details you need for building the camp kitchen and stools are given on these pages, but if you'd prefer to work from full-size plans, send $1.00 for pattern 336 to Steve Ellingson, Popular Mechanics Pattern Dept., Box 2383, Van Nuys, Calif.

Preschooler's Desk Chair

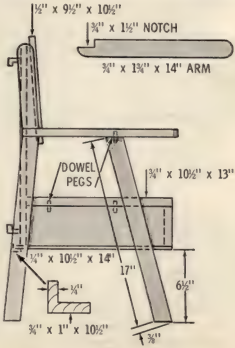
DESK BOARD stores behind the backrest, is held in place by two angle brackets and a lip on the rear edge of seat box

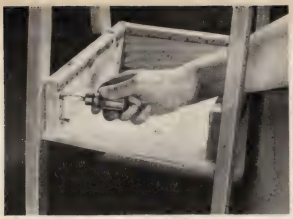
By Elma Waltner

AS ANY FOUR-YEAR-OLD will tell you, coloring is an exacting operation demanding plenty of flat work surface located at just the right height. This small desk not only meets these stringent requirements, but converts to a comfortable lounge chair for TV watching simply by pulling off the desk board and slipping it down behind the backrest. It also includes roomy underseat storage for coloring books, crayons and other treasures.

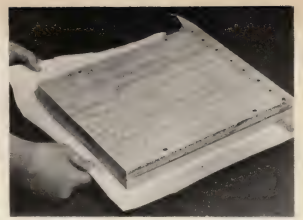
Construction is basically simple, with most joints glued and screwed. In locations where screws would show, such as the joints between the arms and front legs, hidden pegs and glue are used. The lift-out seat is held in place by pegs set in the top edges of the seat compartment sides.

Both the seat and the backrest are padded with sheets of 1-in. foam rubber. Vinyl upholstery cloth was used on the chair shown here, since it wears well and can be wiped clean with a damp cloth. The arms, legs and desk board were left natural and given two coats of tough plastic varnish after having been sanded smooth. If you desire to cover the rear surface of the backrest with upholstery cloth, cut a sheet of vinyl slightly oversize, fold edges under and secure with upholstery tacks.

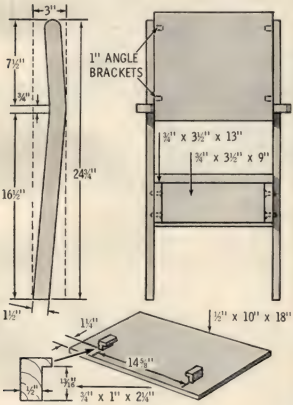




AFTER ASSEMBLING and covering seat box, attach the legs to it by driving screws from inside of box



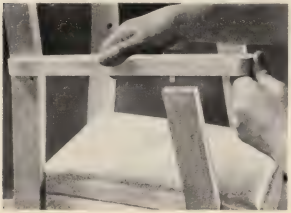
UPHOLSTERY CLOTH is pulled tight over seat and tacked in place, folding corners as shown below

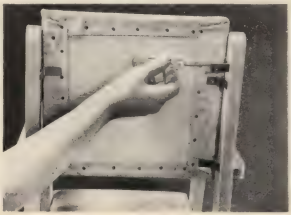


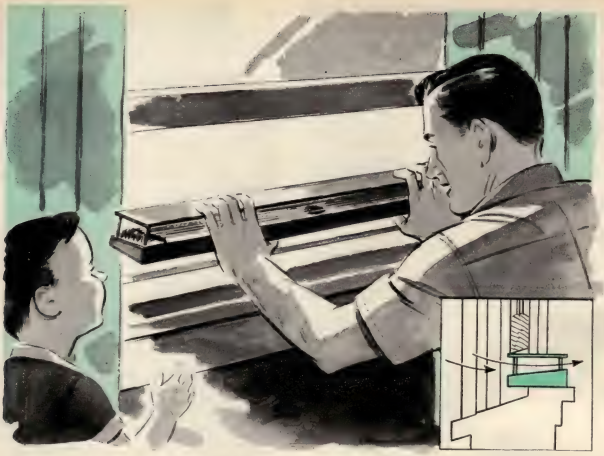
CHAIR ARMS are attached with screws driven through rear legs and pegged-glued joints at the front legs

AFTER UPHOLSTERING, place seat over storage box and mark locations for drilling holes to match pegs

ANGLE BRACKETS to hold the desk board when stored face opposite those used to install the backrest







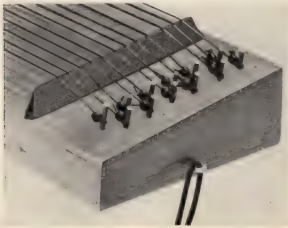
Aeolian Harp

By Dennis D. Dorogi

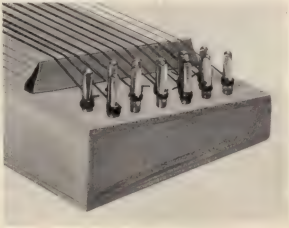
ALMOST UNKNOWN today, the aeolian harp works on a principle that was familiar as far back as biblical times. It is recorded that King David liked to hang his harp over his bed when retiring, so he'd be lulled to sleep by the sound produced as the night breezes played over the strings to set up varying patterns of vibration.

Basically, this harp consists of a long narrow sound box over which a dozen nylon guitar strings are stretched—four Gs, four Bs and four Es. They are attached to headless nails at one end and tuning pins at the other. These pins are designed

NYLON STRINGS are attached at one end to headless nails driven at an angle into the end filler block



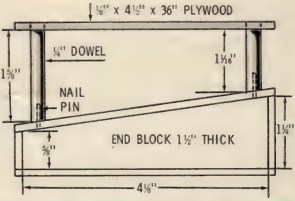
TUNING PINS hold strings at the opposite end, allowing you to adjust tension with a tuning wrench

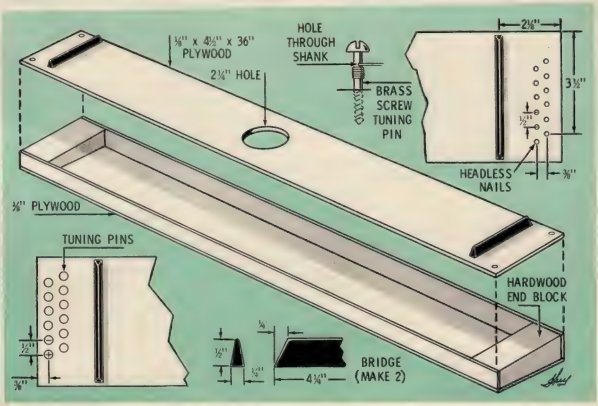


for use in auto-harps and zithers, and can be ordered at most music stores. Order a tuning wrench at the same time, since this is required to turn them. If desired, brass screws, drilled crosswise to hold the strings, may be substituted for the pins. All strings should be tuned to the same note, usually a low G.

The length of the sound box isn't important, so the instrument can be designed to fit any window. Place it on the sill and lower the window so it rests on the cover and holds the harp in place. The raised cover directs strong air current over the strings, producing an etheral sound which varies with the wind intensity. ★★★

REMOVABLE COVER directs wind over angled surface of sound box. Nail pins in posts fit holes in box





Building PM's Patio-Garage

By Manly Banister, with Dick Chilson

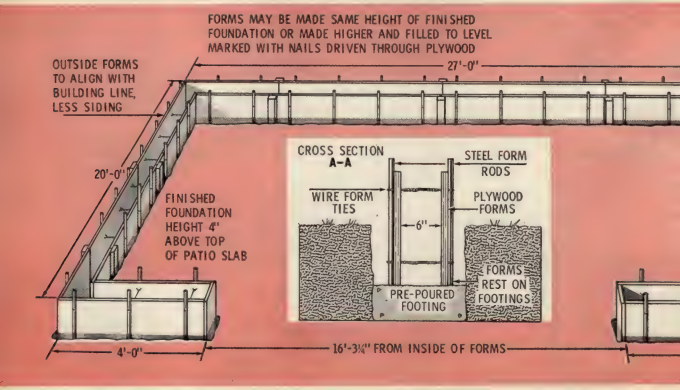
LAST MONTH, Part I took the concrete work up through pouring the patio slab and the garage-wall footings. Now it's time to erect forms on top of these footings, for pouring the foundation walls. The forms detailed below and pictured in the photos were erected by a contractor we called in to speed up construction. They consist of plywood panels tied together by wire "tourniquets" with eyes at both ends that pass through holes in the panels and are secured with vertical steel rods. This assembly merely sets on top of the footing, and is held erect and centered by braces nailed to stakes (photo, next page).

After the poured concrete has set, the rods are withdrawn and the panels stripped off. The lower tie wires are, of course, left embedded in the wall; before back-filling, the protruding eyes are clipped off on each side with wire cutters.

Since the forms shown were not custom-made for this job, they stand much taller than our foundation requires; if you build your own, you'd probably want to level them off at the height of the desired wall, regardless of how deep your footings might be—not only to save form material, but so you could pour the forms *full*, and rod-off along their top edges. When oversize forms are used, as shown here, nails are driven through the panels, along a leveled chalk line—then the concrete is poured to this level and the nails pulled out before the mix sets.

Of course, you can avoid erecting forms at all, if you prefer to lay a foundation of concrete block. In this case, you'd want to dig a wider footing trench so that you could get into it to lay your first course. Here, again, the depth of the footings would dictate the number of courses.

Whatever your method, you need a wall that stands an accurate 12 in. above your highest grade. Start from that point and adjust the form panels with a level—or, where the panels are over-height, scribe your pour line around the entire foundation, again checking with your level. To bridge the 16-ft. door opening, hang a straight-edged plank from the top of the "bulkheads" at the ends of the two short wall forms. Whatever the height of your forms, these bulkheads should be level with the top of the poured wall, and should be only tacked temporarily across the form panels. When the suspended 2x6 straightedge is leveled (see first photo,



NEVER WAS A GARAGE put to brighter purpose than this: built into its end wall is an outdoor kitchen to serve the patio

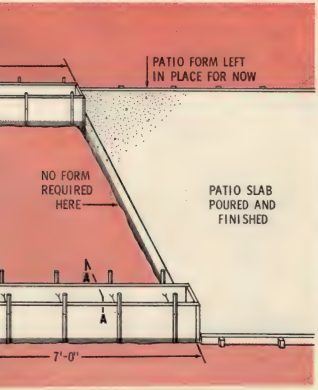
next page) by means of adjusting the form bulkheads up or down, nail the latter firmly in place.

The foot-above-grade wall allows for 4 in. of gravel fill, a 4-in. slab and 4 in. of foundation above the finished floor.

The best way to pour concrete into the forms is directly from the chute of the mixer, if you can position the truck to reach. It's a two-man operation: one holds a plywood panel against the far side of the form, opposite the end of the chute, to direct the flow into the form, while the other rams and spreads the concrete for a solid fill, using a length of 2x4.

When the pour is completed and leveled, but before it sets up, insert ½x10-in. foundation bolts no farther apart than 8 ft., to provide for tying the building down.

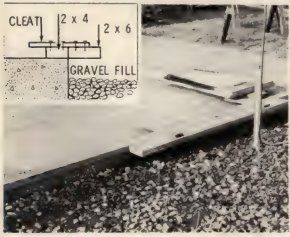
Assuming you've already stripped the sod from the area that is now enclosed by forms, you're ready to strip the forms from the poured foundation walls and spread a layer of gravel over the floor area, to



FOUNDATION FORMS are needed for back and end walls, and two short walls that flank 16-ft. door. Form below is higher than necessary for 12-in. foundation

LEVEL FOUNDATION FORM at door gap by hanging plank between bulkheads, adjusting them till it's level

ALONG PATIO EDGE, anchored 2x4 is form for garage pour. A 5-ft. 2x6 hangs over edge to form recess



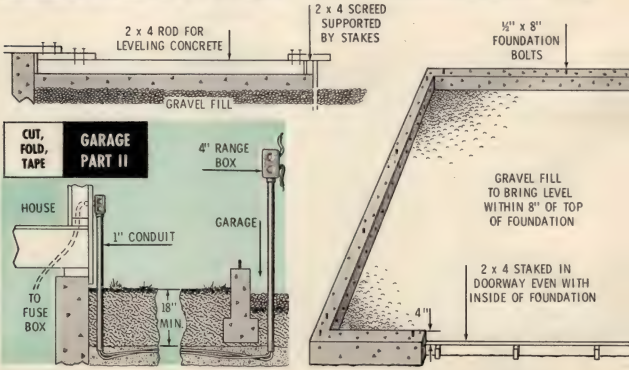
within 8 in. of the top of the foundation. *Never pour concrete directly on sod.* The sod eventually rots out, leaving a space for settling, and the sagging slab will crack. Incidentally, I used no reinforcing such as welded-wire fabric, because my area is not subject to frost heaving. Where winters are more severe, you may want to reinforce the concrete to prevent cracking.

Now's the time to dig a trench for the electrical wiring, and to bring it up inside the foundation through one-inch electrical conduit topped by a suitable box. The paths of the cables are shown in color on the sketch below left, along with the paths of the water line and drain pipe for the sink. I brought power cables from the service entrance of my house to just inside the 16-ft. door. I trenched 18 in. below grade and laid approved two-wire #12 underground cable in a bed of sand, covering it with more sand. The water line was buried in the same trench, before backfilling, while the drain pipe was trenched to a special drywell—in my case, a simpler method than tying it into my home drainage system.

The cables from the post lamps were brought across the garage footing before the patio slab was poured; these are now

ARCHITECT'S PLANS

If you find that an architect's working blueprint is required to secure a building permit, you can obtain a standard 17 x 23-in. plan (Scale: ¼"=1'0") by sending $1 to *Popular Mechanics Magazine,* 575 Lexington Ave., NYC



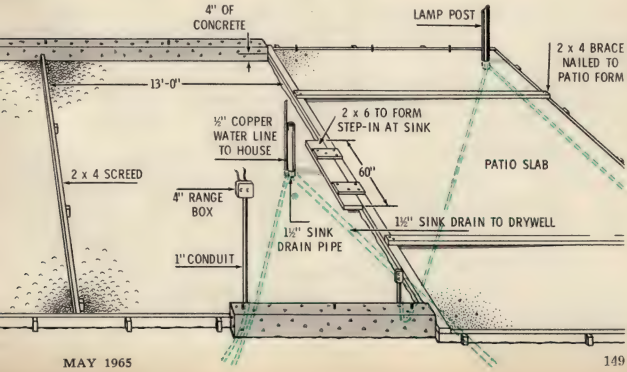
HOW GARAGE FLOOR WAS POURED AND TROWELED

BECAUSE DRAINPIPE and waterline stick up, rod off to this point along patio, then fill rest of form

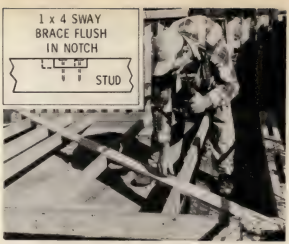
BULL FLOAT smooths surface after entire patio side of screed has been poured, rodded off, jitterbugged

OUT COMES SCREED, once second half of pour has been jitterbugged; bull-float whole slab to close gap

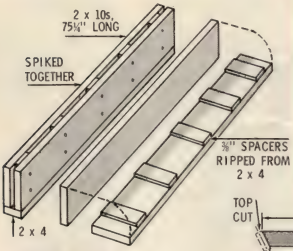
STEP-IN BAY at patio-edge of pour is finished off with rubber float, after removing cantilevered 2x6



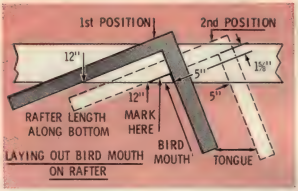
ANCHOR MUD SILL to top of foundation wall by drilling it to match protruding bolts, dropping it over them and turning the nuts up tight with a wrench



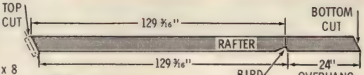
ASSEMBLE END WALL flat on slab. Here, a sway brace is nailed into notches angled across outer edges of studs to let brace into frame. Use two nails per stud

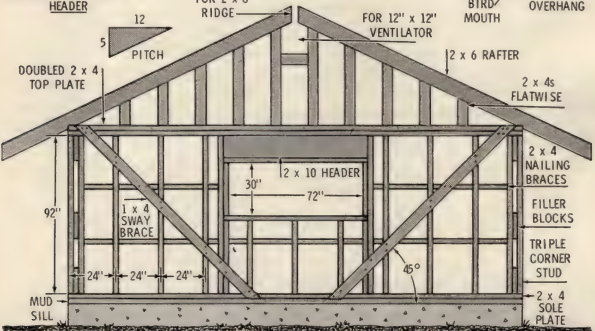


LAMINATING WINDOW HEADER

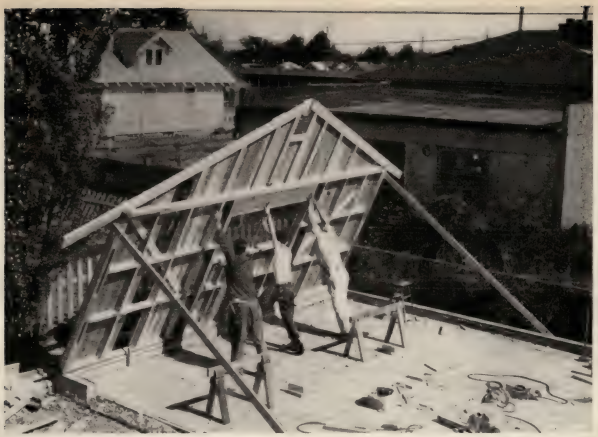


LAYING OUT BIRD MOUTH ON RAFTER





LEFT-END ELEVATION



RAISE WALL ONTO SILL and nail sole plate to it after setting it plumb by means of two side braces. These are attached with one nail so they'll pivot as they follow, preventing collapse if men should stumble

fed into a switch box located inside what will be the entrance from the garage to the patio. This switch will be wired to the entry box after the walls are erected.

Check the gravel level with a mason's line stretched across it; a dish in the middle can play hob with calculations for the amount of concrete you'll need.

The plan (page 149) shows how to lay out the floor area for the pour. Divide it in half with a 2x4 "floating screed" staked in place, and prepare a 2x4 rod for leveling the slab. The rod must be long enough to bridge half the area. Close the door gap with a 2x4 staked in flush with the inside face of the foundation wall.

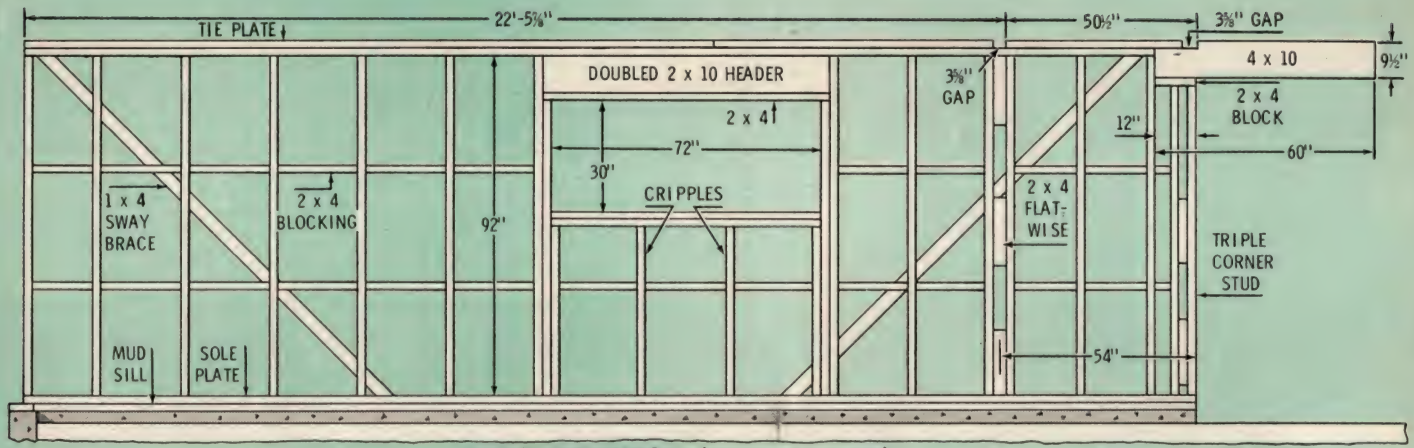
Since the garage floor is to be 1½ in. higher than the level of the patio slab, lay a 2x4 on top of the slab along the edge and hold it there with 2x4 braces nailed to the patio form on the far side. To form the step-in bay for the sink compartment, measure in 4 ft. from the front edge of the patio, then cantilever a 2x6 over the fill (photo and inset sketch, page 148).

Our concrete was the same 1:3:4 mix used for the patio. The center screed simplifies both pouring and leveling, since you do half the area at a time. First, the half on the patio side is poured, leveled, jitterbugged and bull-floated; then all these operations except the last are repeated for the other half. Before bull-floating the entire area, pull out the screed. If any areas look low, shovel on more concrete and bull-float it down. As the concrete sets up, work it first with the wood float, then with a metal trowel. Don't overwork it until it's glass-smooth, since this makes for hazardous walking. When the concrete has set up enough to be firm, carefully lift away the 2x4 form along the patio; this uncovers the bay recess so you can work it with a rubber float.

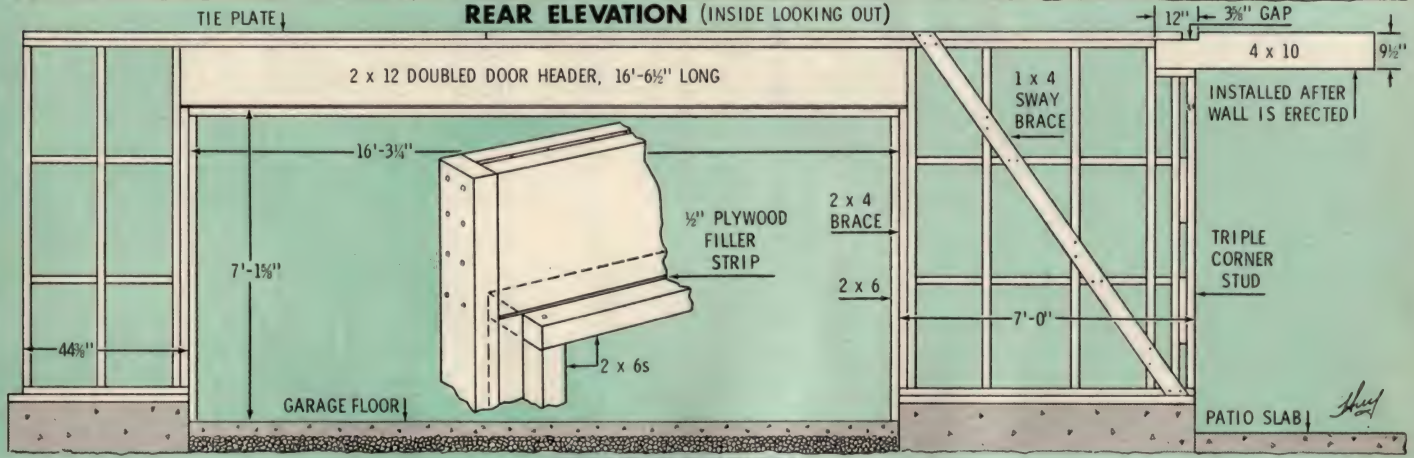
Your concrete work is now completed—except that if the weather's warm and dry, you'll want to prevent too-rapid curing by spraying the slab with a hose occasionally for several days.

By now you'll have ordered the lumber from last month's bill of materials. Be sure to stack it someplace handy, organizing the pieces in the order they'll be used. If my delivery men are any gauge, your lumber (Idaho White Pine, Western Red Cedar and Douglas Fir) will be dumped with the mud sill material on the bottom and the shiplap for the roof on top. A few hours spent sorting lumber (including the shiplap by length) saves time and vexation later.

Now, cut all foundation-wall studs to length. You'll need 32 studs 92 in. long. Cut only one from each 16-ft. 2x4 and lay



REAR ELEVATION (INSIDE LOOKING OUT)



FRONT ELEVATION

what's left aside; you'll use these pieces later, as studs for the patio wall. (Since that wall doesn't sit up on a foundation, the studs must be longer.) The photo at the right shows how an 8-in. circular saw can be used to gang-cut the 92-in. studs from the 16-footers. For working convenience, line up four saw horses on the garage floor.

You'll note from my framing plans on pages 150 and 152, and from the photo below, that I substituted horizontal sliding-sash windows for the conventional fixed-sash type indicated on the architect's elevations (pages 140-141, April '65 *PM*). Whatever your choice, be sure to have the sash on hand before framing the openings.

At this point, I figured how many pieces of the 1x12 Western Red Cedar siding I'd need for the back wall and the garage-door wall, and cut them to length. You'll note that the siding on these eave walls extends from the top of the tie plate to 4 in. below the top of the foundation.

When I'd cut all the siding I thought I'd need for my early work, I sliced some battens from the same 1x12 cedar. I cut these overlength, then trimmed them as needed when I nailed them on, later, after the walls were up. A radial arm or bench saw is essential for fast, accurate cutting of these 2-in. battens. If you don't have access to such a tool, you can, of course, buy ready-cut 1x2 battens.

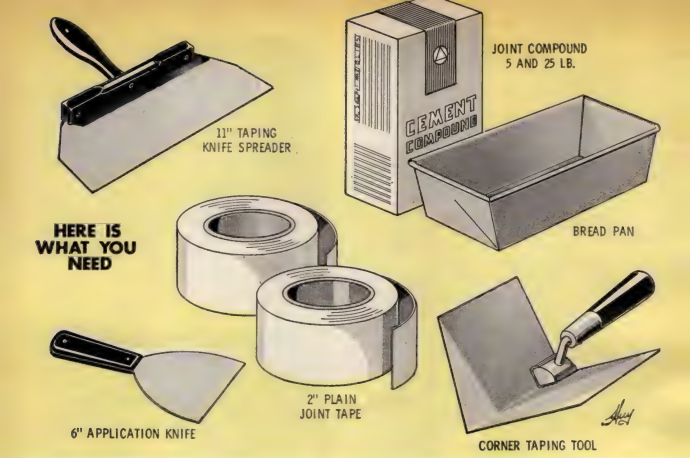
All this assumes that you wish to reproduce the appearance of the garage presented here. The board-and-batten treat-

(Please turn to page 198)

PORTABLE CIRCLE SAW makes fast work of gang-cutting studs from 16-ft. 2x4s laid edge to edge and scribed across with a carpenter's square, above

CONCRETE SLAB now serves as platform for assembling back frame, outer face up, so siding can be applied before wall is raised into place, as below

WALL RAISED, man (far right) nails 2x4 brace between end stud and ground stake. Other end of wall is then nailed fast to the corner of gable wall. After additional bracing, sole plate is nailed to the mud sill



Remodel with Drywall

By Steven J. Howard **Conclusion**

WITH YOUR NEW ROOM neatly drywalled, you're ready to tape the joints (page 162, April '65, *PM*). But, before starting this phase of the job, remember that careless taping can make an otherwise professional-looking drywall job appear amateurish.

You start, of course, by buying supplies. When doing so, note that you'll see two products on your dealer's shelf which are often confused. One is called joint cement, the other Spackle. You want joint cement. It's used, in conjunction with paper tape, to fill and conceal joints between panels of drywall, cover nail heads, etc. Spackle is made for repairing cracks in finished walls. It should never be used in place of joint cement.

Joint cement, incidentally, comes in powder form, to be mixed with water, or pre-mixed. Powdered cement is less expensive than the ready mix and can save you a few dollars when you have to finish an entire room. But the ready mix is easier to use. It goes on smoothly and sets up more smoothly than the powdered form. If applied carefully, it eliminates a sandpapering step between applications.

Another product you'll need is the paper joint tape mentioned before, which is used to cover joints between panels and in inside corners. (Outcorners, as explained last month, are squared up with corner bead, so need not be taped. They are merely covered with cement.) At first glance, this tape looks like a roll of plain paper. But holding it to a light reveals innumerable tiny burnt-in holes. The joint cement penetrates these holes to improve the bond between cement and tape. There's also a joint tape that has visible holes punched into it in a regular pattern, to serve the same purpose. Either type does the job well.

Another characteristic of drywall joint tape is roughened edges. This insures that the edges will feather out properly when covered with cement, eliminating edge marks and making the final wall surface smooth and wave-free.

As for tools, you'll need a 6-in. broad knife to apply the cement, and an 11-in. spreader-knife for feathering out the edges of the cement. Two optional but handy tools are a 14-in. plasterer's trowel and a cornering tool. The former can be used in place of the 11-in. spreader knife for feathering joint cement, while the latter simplifies the job of smoothing inside corner joints. Finally, if you use powdered cement instead of pre-mixed, you'll want a wooden paddle or a potato masher to mix it with, and an ordinary bread pan in which to mix it.

Once you've purchased all the above items, you're ready to begin. Assuming you've bought powdered cement, the first step is to mix it. Don't take this step lightly, as it's more critical to good results than most people realize. The container or pan you mix it in must be clean. Note the water-to-powder ratios given on the package of compound and follow them to the letter. Use lukewarm water. Add the powder to the water and stir vigorously with the mixing paddle, or mash with the potato masher for several minutes. Make sure all the compound is uniformly wet. If you prefer mechanical mixing, you can buy electric-drill attachments for this purpose. But don't use them at drill speeds of over 400 rpm, or you may whip bubbles into the cement. After mixing, allow the compound to sit and soak for about 30 minutes. This gives the material a smooth texture, free of lumps.

Generally, the mixture should be as smooth as soft whipped butter. To test for proper consistency, scoop up some compound on your 6-in. broad knife and turn the knife over. If the compound sticks for a few seconds before dropping off, you know it has good consistency. If it's too tacky it will adhere for a long time before dropping off. If too thin it will run off like cake batter. In either case, don't try to "doctor" this batch. Mix up a new one.

By the way, joint cement should be mixed, used and allowed to dry at temperatures of no less than 55° F.

To begin the taping operation, take your 6-in. broad knife and run it across the nails in the drywall. If any project above the surface, they'll scrape against the knife. Drive them home, leaving a dimple in the plasterboard.

Now, start at the flat joints. (A flat joint is formed by two panels meeting straight-on—as opposed to corner joints.) Each flat joint forms a shallow valley where the tapered edges of the panel meet. Using the 6-in. knife, fill one of these valleys with a good application of joint cement (photo, top right), bringing the cement 1½ to 2 in. out beyond the edges of the valley.

HOW TO FILL AND TAPE JOINTS

APPLY JOINT CEMENT to the valley formed by the tapered edges of two adjoining panels of drywall

PRESS JOINT TAPE into the cement with the edge of applicator knife, then apply more cement over tape

NEXT DAY, when cement is dry, apply two more coats of cement. Feather edges to make joint invisible

TO TAPE INSIDE CORNER, fold tape down its center, then press it into corner with knife or corner tool

FIRST STEP IN PATCHING a small hole is to draw 3-in. or larger circle around it, then cut out circle

CUT A RECTANGULAR support piece to fit behind hole, "glue" piece in place with contact or joint cement

Next, apply tape immediately, pressing it into the fresh joint compound with the knife blade. Use a steady, even pressure. After the tape's in place, apply a covering coat of cement, then draw the knife evenly along the joint to remove any excess compound. Now repeat the entire process for the next joint, and so on.

Inside corner joints are almost as simple as the flat joints. First, "butter" both sides of the corner with a good application of joint cement. Use the 6-in. knife, and extend the cement out about 2 in. to the side of the corner on each wall. Measure off enough tape to cover the corner from top to bottom and fold it down its center. Some tapes are pre-creased for easier folding.

Embed the tape into the cement so the fold falls into the corner, then smooth the tape down its length with the 6-in. knife or the cornering tool. Follow with a covering coat of cement as you did on the flat joints, bringing it out beyond the edges of the tape. This coat may also be smoothed with the knife or cornering tool.

Next come outcorners. Unlike the joints we've discussed so far, outcorners are not taped. As mentioned before, you will have covered them with corner bead. All you do now is apply a first coat of cement, right over the corner bead.

Now you're ready to cover the nails on the surface of the entire wall. Using the 6-in. knife, apply a coat of joint cement over each nailhead. To do this, first fill the dimpled area with plenty of cement, then scrape off the excess. In removing the excess, press hard on the knife to make sure the compound is level with the surface of the drywall.

After treating all nails, let the cement dry overnight. Next morning, if the cement has dried properly, it will have

A FEW HOURS LATER, cement a plug of plasterboard to support piece and allow patch to dry thoroughly

turned from gray to white. Over the nails, it will have shrunk while drying to form slight indentations. If any of the cement looks dampish or slightly gray, wait a few more hours before going ahead.

When all cement is dry, mix up a new batch and apply a coat to each joint and corner, using the 11-in. spreader knife or the 14-in. plasterer's trowel. Be sure to feather this coat 1½ in. beyond the edges of the previous coat. Then apply a second coat of cement to the nailheads, using the 6-in. broad knife.

When the cement has again dried thoroughly, sand all the joints and nailheads slightly. Then apply a thin finish coat to the joints and corners, feathering out at least 2 in. beyond the previous coat. Finally, apply a finish coat to all nailheads. Now let dry for the last time and you're ready to paint or paper the walls. Before doing so, it may be necessary to sand all cement once more, to insure a smooth surface.

Now, suppose you've had plasterboarded walls in your home for some time, and they've become damaged. This can happen in one of four ways: (1) nails can pop; (2) cracks can appear due to normal settling, usually extending from a top corner of a door or window frame to the ceiling; (3) holes could have been punched into the wallboard, probably by an active youngster; (4) massive breaks can run practically from stud to stud—usually as a result of heavy impact.

Several repair methods are possible for each type of damage. However, here we will discuss only the latest thinking in this area, and those methods which provide the most professional-looking repairs for the least amount of time and effort.

• **Nail Popping:** This damage occurs for only two reasons. Either nails weren't hammered in properly when the plasterboard was first installed, or the studs have shrunk, thus squeezing some nails out. The latter condition often becomes apparent during the heating season, in which case, repairs should be delayed until after the heating season. Otherwise further shrinking can occur and, with it, further nail popping. In addition, it's also best to wait until you're ready to redecorate the entire room, since the repairs will deface existing paint or wallpaper.

Start the repair by driving a new 1¼-in. annular ring nail 1½ in. above or below each popped nail. This will provide extra holding power to resist the forces that are working against the nails. While hammering, apply strong pressure with your free hand against the plasterboard to bring the board in firm contact with the stud. Dimple the surface of the board with your last

WHEN PATCH IS DRY, cover with joint cement, then apply two or three overlapping strips of joint tape

TO CONCEAL PATCH, let initial coats of cement dry, then follow with two more coats, as on joints

hammer blow, to make sure the head is below the wall surface.

Now drive each popped nail back in, also dimpling the board surface. Scrape all loose cement from around the nailheads—both old and new—and re-cover all nailheads with fresh cement, using the same procedures as previously described for new plasterboard.

• **Cracks:** As you probably know, cracks should be widened and brushed clean to assure a proper base for repair compound. After you've done this, fill the crack with Spackle, which was designed specifically for jobs such as this. Then dampen the Spackle with a sponge to assure a smooth surface when dry. After the Spackle has dried, sand lightly, then apply another coat of Spackle—this time feathering the

WHEN LAMINATING ¼ or ⅜-in. plasterboard over old plaster or plasterboard, spread joint cement on back of each panel with homemade tool (inset)

edges as you did with the joint cement.

This simple repair should prove effective. But remember that cracks can reappear in the future, because filling them does not remove the expansion and contraction of the framing, the vibrations or the settlement that caused the crack in the first place.

If a crack keeps reappearing, one sure remedy is not to fill it, but to hide it. To do this, just apply joint cement and tape as you would over a joint.

• **Plugging Holes:** Maybe you've read that you can stuff a hole in plasterboard with newspaper or some other material and patch it with Spackle. This method works, but leaves a fairly weak spot that is easily knocked out. The best way to repair a hole, then, is with a tight plasterboard plug. Here's how:

Draw a circle around the hole (photos, page 156). Make sure the circle is at least 3 in. in diameter—larger, of course, if the break is larger. Anything smaller than 3 in. wouldn't allow you to get your hand into the hole to install the support strip, as you'll see. A coffee cup or container makes a good circle outliner.

With a keyhole saw, cut out the piece outlined by the scribed circle. Then, take a scrap piece of plasterboard having the *same* thickness as the wall, cut a circular plug that measures a bit smaller in diameter than the hole. Cut a rectangular support piece of scrap plasterboard so its length is 2 in. or more greater than the diameter of the hole in the wall and its width a bit less than the diameter.

Now, coat the ends of the support piece with a generous amount of joint cement or contact cement. Insert it into the hole and press it against the back of the wall. Hold it there until it takes hold, then let it dry for a few hours.

Next, coat the back of the circular plug with a generous amount of joint cement and insert that into the hole so it butts against the support piece. When that cement is dry, coat the patched area with joint cement and cover with several strips of joint tape and another layer of cement. Let it dry and coat with another layer of cement, sanding beforehand if necessary. Apply still one more coat of cement, let dry, sand if necessary, and you can paint or paper.

• **Massive Damage:** Unless you've got a couple of kids who like to see how much punishment household items can take, this type of problem isn't common. However, the repair is a good one to keep in mind should a large area become so badly marred over the years (without an actual break being made in the wall) that no amount of paint will conceal the damage. It'll save you the trouble of ripping down a whole panel for replacement.

Start by penciling a rectangle around the break, making sure each vertical line is drawn over the center of a stud. Cut along the horizontal lines with a keyhole saw and along the vertical lines with a plasterboard knife, but watch out for nails in the studs as you cut and work around them. When removing the damaged piece, pull all its nails from the studs.

Next, cut a piece of plasterboard of the same thickness so that it matches the outline of the piece you've removed, but is 1/16 in. smaller all around. Fasten this replacement panel to the studs with plasterboard nails. Treat all nailheads, and the joints at the edges of the replacement panel, as you did with new plasterboard. Be sure to prime the replacement piece before painting.

If your walls are very badly marred, it may be simpler to cover them completely by building new walls right over the old. This can be done without noticeably reducing the dimensions of the room, with ¼ or ⅜ in. plasterboard. Depending on the circumstances, you can either nail the new material directly over the old or use the lamination technique. The former method works only over old plasterboard, the latter over plaster or plasterboard.

Before installing the new wall, check the surface. You don't have to patch up every bit of damage, but any high spots or bumps in the old wall which might pre-

vent good contact between new and old should be scraped or sanded down. Loose plaster or wallpaper should be removed and any sizable holes should be patched with Spackle or joint cement. Glossy paint must be roughened with sandpaper.

If you employ direct nailing, you'll want to use a nail which is long enough to penetrate the studs 1 in. Such a nail is a 6d drywall type (1⅞ in. long). Space nails 8 in. on wall, 7 in. on ceilings.

Spotting Studs

Possibly the toughest part of nailing plasterboard over an old wall is locating studs. You can probe beneath the surface of the wall with a nail to find a stud at a corner of the room, then keep in mind that normally studs are spaced 16 or 24 in. apart, center to center. Or you can buy one of several stud locating devices on the market.

If you decide to laminate the new plasterboard, plan the job as described last month to minimize the amount of taping and nailing you'll have to do. Then cut each panel to fit, if necessary, and lay it face down on a pair of sawhorses. Now spread joint cement over the back of the panel (see photo, opposite page).

Scrap Material Holds Panels

Install the first panel by pressing it into place. Use heavy pressure to insure an adequate bond. Now, install the next panel, making sure the joint between the two is tight. To hold panels in place until the adhesive dries, take several pieces of scrap plasterboard and lay them over the joint. Drive 8d common double-headed nails through the scrap piece and right into the joint. Any mark left by the nails will be covered later when you tape the joints. Three pieces spaced evenly along the joint are enough. Remove them after 24 hours and tape the joints.

• **Specialty drywall materials:** In this article, and last month's, we've been concerned with standard, unfinished plasterboard. However, we wish to acquaint you with some other types which have specialized uses in remodeling.

One is a ⅜-in. material that comes with a wood-grain finish. Walnut, cherry and teak are among the grains available. Such panels cost less than comparable grades of wood paneling, and are installed with precolored nails that match the finish. In some cases, they may be installed with a combination of nails and adhesive, or with wood or metal moldings.

Prepainted Plasterboards

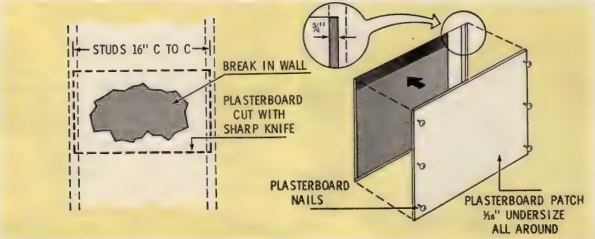
Another specialty plasterboard comes with a factory-applied pastel finish that's comparable to one coat of semi-gloss paint. By installing this product with matching nails and moldings, you can save a paint job, or put it off for several months without having to stare at bare, unfinished wall surfaces.

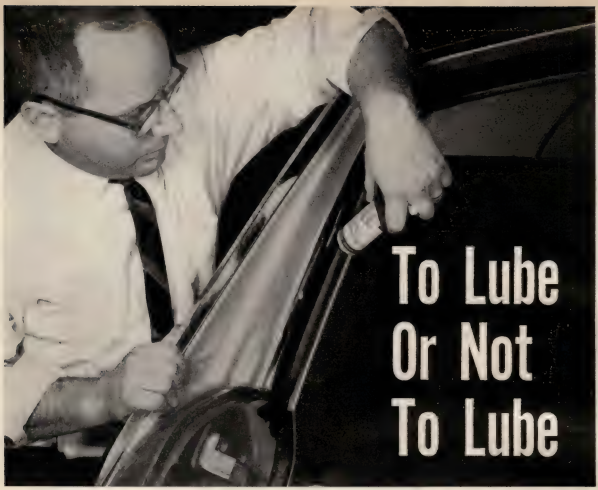
Insulating plasterboard is standard plasterboard with a covering of aluminum foil on the back surface, to serve as a reflective insulation and vapor barrier.

Vinyl-surfaced backerboard is a waterproofed plasterboard that is applied as a base material for ceramic tile and also plastic tile near bath tubs and in shower areas.

Pre-decorated vinyl-surfaced plasterboard comes with a colored vinyl overlay that has a textured finish. Applied with adhesives and/or colored nails and moldings, it needs no painting, and can be cleaned with soap and water—a good choice for family rooms, especially with small children in the house. ★★★

HOW TO MAKE A LARGE PATCH IN DRYWALL



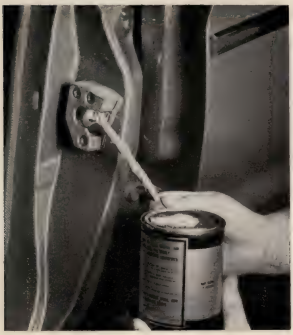


To Lube Or Not To Lube

Creampuff or rattle-trap? The difference could be as simple as how carefully and thoroughly you lubricate your car. Here's the right way

PART 1

By Morton J. Schultz



MULTI-PURPOSE GREASE, shown here being applied to striker of door lock, does job of two other lubes

JOHN'S NEIGHBORS call him eccentric. On many a Saturday morning they see him working on his trusty '61 Ford, dabbing a little grease here, squirting a bit of oil there.

But that weekly puttering gets results. John's car is a creampuff. No rattles. No squeaks. In fact, it's tighter than many a '65 I've seen.

His secret is simple: LUBRICATION. Not the usual chassis lube every so-many-thousand miles, but a continuing program of applying just the right lubricant whenever and wherever the car needs it.

To get things into perspective, this type of lubrication involves three phases:

1. Lubricating body points.
2. Lubricating mechanical and other movable parts which play a direct or indirect role in the operation of the vehicle.

3. Lubricating the chassis and gear cases, such as the transmission and differential. We've separated the cases from the mechanical parts in Phase 2 because they're usually treated at the same time as the chassis. The parts in Phase 2 might need lubrication before the chassis grease interval is reached.

"But is such thorough lubrication worth the time and effort?" you ask. "My owner's manual doesn't recommend anything but regular chassis lubes."

Well, if you can afford to trade in your car on a new one every year or so, we'd say the benefits might not be worth the trouble. But the buyer who wants several years of service from his car, with a minimum of trouble and repair bills, will find that thorough lubrication helps him achieve that goal.

Now, taking the three phases of our lube program in order, let's discuss lubrication of body points. Although a chassis may or may not require lubrication as often as some people think—that's the subject of next month's *Saturday Mechanic*—these body points should get fairly frequent attention. Fortunately, however, this is certainly one job you can do yourself: it'll take maybe one hour on a Saturday.

What are the benefits? Getting rid of a lot of little squeaks, rattles and other annoying noises, insuring that these parts operate freely, and protecting them against rust and wear.

Treating the Body Points

On most cars, there are more than 20 points on the body that should be lubricated. On others, they may be 30 or more, depending on the body style.

A big question is, of course, how often to hit them. No hard and fast mileage figure can be given. You won't hurt anything by hitting them too often, but you don't want to waste time either. So I can only say, "play it by ear."

What I do is lubricate these parts at least twice a year—in the fall to protect them against winter and in the spring to offset any possible winter-caused problem and get the car ready for the pleasure driving of summer. In between time, if any noise or binding problem develops when I operate any of the parts (such as opening a door or rolling down a window), I administer a shot of lube. If squeaks and rattles seem to develop throughout the whole car while driving, I lube all the body points again.

The chart on pages 162 and 163 tells you where to lubricate your car body and what types of lubricants to use. Might I suggest that you clip out the chart and keep it as a permanent reference? There'll

DRIED-OUT WEATHERSTRIPPING on a door can produce an irritating squeak when door is opened. Keep it pliable and noise-free with silicone spray lubricant

DOOR LOCKS, often ignored as lube points, should be treated with spray or motor oil and flake graphite

DON'T FORGET WINDOW CHANNELS. Silicone spray or grease lube will assure continued smooth operation

LUBRICATION CHART . . . . . .

UNDER THE HOOD

LUBRICATION POINT	LUBRICANT TO USE	CONSIDERATIONS
Latch dowel	Multi-purpose grease or dry stick silicone	
Latch plate hole	Multi-purpose grease or dry stick silicone	
Safety catch	Multi-purpose grease or motor oil	If you use motor oil, it should be 10 weight. The safety catch might be in the latch plate or it could be hanging down from the hood. Lube either type
Hinges on both sides of hood	Multi-purpose grease or motor oil	Work the hood up and down to pinpoint all pivot areas, and lube them. Use oil sparingly
Hood torsion bar	Multi-purpose grease or dry stick silicone	In some cars, particularly some newer Chrysler models, this bar is part of the hood hinge assembly. Lube all pivot points, and any spots on the bar that touch the body or hood of the car

DOORS

LUBRICATION POINT	LUBRICANT TO USE	CONSIDERATIONS
Door latch	Multi-purpose grease, motor oil or dry stick silicone	Lube rotary, toggle and lift-bolt-type latches with multi-purpose grease or motor oil. If you have a double toggle-type latch, use multi-purpose grease or dry stick lubricant. If motor oil is used, apply just a drop
Door latch striker	Multi-purpose grease, dry stick silicone or motor oil	Treat strikers for rotary and double-toggle latches with multi-purpose grease or dry stick lubricant. Strikers for toggle and lift-bolt types are treated with multi-purpose grease or motor oil
Door hinge pins	Multi-purpose grease, silicone spray or motor oil	No matter what type of hinge your car has, lube the top of the pin and all joints in the barrel. If you use grease, lay it on and work it in by moving the door back and forth. If you use a spray, apply it to the entire hinge barrel
Door checks	Multi-purpose grease, chassis grease or motor oil	Lubricate the hold-open mechanism on *all* sliding surfaces. On spring-type and roller-type checks use multi-purpose grease or chassis grease. On folding-type checks use multi-purpose grease or motor oil. On any other type, use multi-purpose grease or motor oil. Don't forget to hit *all* pivot areas
Door weatherstripping	Silicone spray or special rubber lubricant	Door weatherstripping can dry out and create a squeak as it rubs against the metal of the body. To prevent this, lubricate weatherstripping around perimeter
Window channels	Silicone spray or grease	To keep windows operating freely, without bind, and to prevent squeaking as they move in the channel, lubricate the channel. If you use the tube silicone, put several dabs in the channel and run the window up and down a few times
Door light switch button	Silicone spray or dry stick	Apply lubricant to sides of button, then work it in and out a few times
Door locks	Silicone spray or motor oil and flake graphite	This is most important to do in the fall, before cold weather sets in. Spray silicone into push-button type locks and around tumblers. Then, insert the key into the tumbler and work it back and forth. Or you can spray the key and insert it into the tumbler. If you use motor oil, apply it only around the push buttons—never inside the tumbler—and lube tumbler with flake graphite

THE TRUNK

LUBRICATION POINT	LUBRICANT TO USE	CONSIDERATIONS
Trunk latch	Multi-purpose grease or dry stick lubricant	
Trunk hinges	Multi-purpose grease or motor oil	Make sure you hit hinge pins and all pivot points
Trunk lock	Silicone spray, flake graphite	Don't forget to work the key in and out a few times after lubing

CUT, FOLD, TAPE **AUTO LUBE**

STATION WAGON TAILGATES

LUBRICATION POINT	LUBRICANT TO USE	CONSIDERATIONS
Tailgate latch	Multi-purpose grease or motor oil	Same procedure as for door latches
Tailgate check link	Multi-purpose grease or motor oil	Note that there are two lubrication points for each check link
Tailgate hinges	Multi-purpose grease or motor oil	Same procedure as for door hinges
Window channels	Silicone spray, tube	Same procedure as for door windows
Tailgate lock	Silicone spray, flake graphite	Same procedure as for door locks

FUEL TANK COVER

LUBRICATION POINT	LUBRICANT TO USE	CONSIDERATIONS
Cover set in fender or body	Multi-purpose grease or motor oil	Lubricate hinge in same manner as door hinges. If tank cap has a lock, treat it in same manner as other locks
Combination cover-license plate holder	Multi-purpose grease or motor oil	Dab grease along the spring-type mechanism, or spread oil along it. Also, be sure to hit any pivot points

INSIDE THE BODY

LUBRICATION POINT	LUBRICANT TO USE	CONSIDERATIONS
Vent-window locks	Silicone spray or motor oil	If you have push-button-type vent locks, spray some silicone around the button and work in and out. On slide type, lube all sliding surfaces and work back and forth. Use oil sparingly
Glove compartment	Multi-purpose grease or motor oil, and spray silicone or flake graphite	Several dabs of grease or drops of oil along the glove compartment door hinge will keep it squeak-free and operating smoothly. Don't forget to put some silicone or flake graphite into the lock
Ignition switch	Silicone spray, flake graphite	Same procedure as other locks
Seat track slides	Multi-purpose or chassis grease	Apply to all sliding surfaces

ON DOOR CHECK MECHANISMS, be sure to hit all sliding surfaces and pivot areas with grease or oil

be another one next month to add to it.

● There are five types of lubricant you can use on body points—motor oil, chassis grease, flake graphite, silicone lubricant and a product called multi-purpose grease. The last one is a petroleum-base, light-weight grease which was originally developed for use on brake backing plates. It can be used in place of motor oil and chassis grease. It's sold under such trade names as Lubriplate No. 110, Delco Brake lubricant and Valvoline X-All Multi-Purpose Grease.

This grease does away with some of the disadvantages of oil. For example, oil can run and get on other parts, upholstery and clothes—especially since people have a tendency to use too much of it. Multi-purpose grease doesn't, even if you apply too much. Also, some oils gel in cold and thaw out in heat. This grease doesn't.

The only precaution you must follow with multi-purpose grease is not to get it on rubber or felt-type material, such as door gaskets, window channels and upholstery fabric.

The silicone spray and silicone stick lubes are also unaffected by temperature. They are used primarily in areas where there is rubber or felt, but also work on metal parts.

● Before lubing each point, wipe off the old lubricant with its accumulation of dirt, using a parts cleaning solvent.

● Apply fresh lubricant sparingly. Excessive oil, for example, can run all over the place. If you happen to get too much lubricant on a part, wipe the excess off.

● At every lubrication point where there are screws or bolts, give them a tightening. If any have worked loose, they could be creating a rattle.

● After lubricating each part, work the lubricant into the area by actuating the part. After treating door hinges, move the door back and forth a few times. ★★★

Auto Clinic

Q The bolts in the oil pan of my 1963 Corvair Monza come so loose that I can turn them back down by hand. It happens this way every two or three months. Should I use lock washers?—P.W.S., Michigan

A Nope—all you need are the correct bolts and a torque wrench. Chevy recommends you now use a ¼-20 bolt in that oil pan and tighten them to from 40 to 60 pounds per square inch. And you can't torque them with anything but a torque wrench.

Q When I adjust the automatic choke of my 1957 Ford, water drips out. In fact, it's just rusted the choke piston fast. What's the cause?—A.H., Penn.

A Probably cracks or splits in the choke heat tube—that tube which runs from the choke housing to the manifold. If damaged, it'll cause a build-up of moisture inside the choke housing when air penetrates and mixes with the heat inside the tube. The job of this tube is to pass heat to the choke from the manifold so the thermostatic spring can ease off and open the choke butterfly. Don't try to patch it—replace it.

Q My 1953 Lincoln Cosmopolitan (low mileage, in good shape) has given me endless carburetor troubles, and no one can seem to pinpoint it. Despite overhauls and adjustments (float, etc.), the carburetor won't stop flooding. Have you any ideas?—F.D., Calif.

A One critical area on this Lincoln carburetor that's often missed in overhaul are those O-rings in the rear barrels. If they're damaged in any way, gas runs past them, down a little tubular affair and into the manifold, causing flooding. Replace those O-rings and see if the problem doesn't clear up.

Q A groan, resembling a vibration noise, seems to be coming from the transmission of my 1964 Chevrolet with powerglide. It's only noticeable when I back up and after the engine's been run awhile. Should I prepare myself for a transmission overhaul?—O.P.L., Mich.

A Not if it's like other complaints of the same nature we've been getting, and not if you have a 327 or 409 V8 engine. If so, the noise probably *isn't* coming from the transmission, but from the rear axle, and this should be checked *first* before going to the expense of having the transmission ripped apart. Seems it has to do with the lubricant put into the rear axle when the car was new—it doesn't always hold up when it gets hot. Chevy states that the problem can be corrected by draining the old lube from the rear and installing Positraction lubricant (part No. 3758791).

Monthly Service Tips

★ Owners of '63 Plymouths, Valiants, Chryslers and Imperials troubled by hard starting and engine cut-out, take heart! Ignition coils manufactured during a certain period were defective and can be replaced. They'll bear the number 2095233 and the build-date code 08-3 through 18-3 on the coil housing. Replace with coil part No. 2084847. But hear this: if your coil has a build code of 19-3 or higher, it's okay.

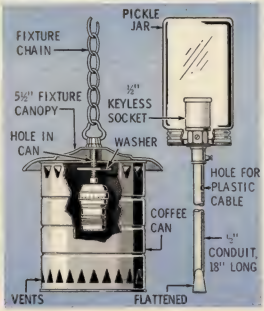
★ When you replace the dipstick in the fill tube of the '65 Pontiac Turbo Hydra-Matic, be sure to push it all the way or you can lose fluid. If the rubber grommet is too tight a fit for a firm seat, apply a film of the fluid to it.

★ Water in the gas tank of your '63 or '64 Studebaker station wagon? It's the fault of a poor fit between gas cap and filler neck. Service bulletin F-1964-2 calls for installation of a water deflector (part number 1562555).

EDITOR'S NOTE: When we began Auto Clinic we had no idea how popular it would be with our readers. Little did we think we'd be so swamped with letters that we'd have to set up a special system with additional help to handle the answers. But that's what has happened. Much as we would like to continue the clinic as a free service to our readers, we find we reluctantly must make a nominal charge to help cover the cost of diagnosing and handling your car problem—if we are to continue to answer all inquiries personally. Write Auto Clinic, Popular Mechanics Magazine, 575 Lexington Ave., New York, N.Y. 10022, enclosing a self-addressed envelope and 25 cents in coin

Patio-Yard Lights

FROM SUCH COMMON, neatly made items as pickle jars, coffee cans and other food containers, plus standard electrical fittings, you can light up your patio and yard with smart homemade fixtures which cost you little or nothing. Among the three examples shown here, the double-duty one above masquerades as a hanging flower urn by day to become a patio light at night. It's simply a large can fitted with a porcelain socket and covered with plastic flowers and moss, wired to the outside. The hanging fixture shown below, left, is a coffee can fitted with a ceiling canopy. Light shines from the vent holes around top and bottom and from plastic cover capping bottom. Glass jars perched on conduit stakes make smart lights for your driveway and shrubs.—*Joseph Braunstein*



Sidewalk Surfboard

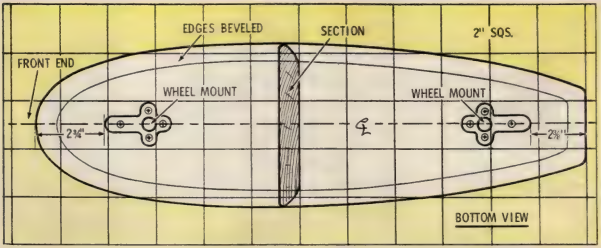
NOW THAT you've read about the newest fad for thrill-happy teenagers—surfing on wheels—in the November 1964 issue, we thought you might want to indulge your own suicidal instincts by making yourself a skateboard. It shouldn't take more than an evening to cut and shape the board and attach the wheels, and a coat of varnish will dry overnight.

The board can be cut from most any piece of ¾-in. solid stock, but like their riders, skateboards receive many bumps and bruises, so for durability it's best to use a hardwood, such as birch or oak. When drawing the pattern for the board, use the grid method to assure an accurate outline. After laying out the pattern, cut the wood to shape on a bandsaw. As indicated in the drawing, the bottom edge of the board is rounded off. The easy way to do this is to tilt the bandsaw table; the hard way involves a plane, rasp, and plenty of elbow grease. Of course, you can go on your ear just as easily with the edges left square.

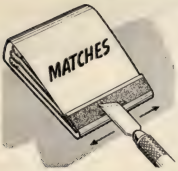
The heart of any skateboard is the wheel, axle and mounting plate. Technically, it's known as a truck assembly. Various manufacturers produce such units; one suitable assembly is the Chicago 76P which is available from Chiska Co., 422 N. Stewart St., Lombard, Ill. at $4.50 per set, postpaid. Conventional roller skate wheels such as those salvaged from worn shoe skates are sometimes used, but the limited tilt-angle of such wheels makes the board much less maneuverable.

ONE FOOT points straight ahead, the other foot is placed crosswise so that the board may be tilted. Springy knees and S-like stance indicate fine form

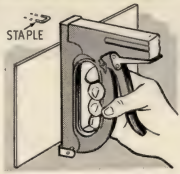
PROFESSIONAL-TYPE truck assembly has tilting action that makes it possible for rider to turn board by leaning to the right or left as in water surfing



TAKE A HINT FROM READERS



STRIKING STRIP on a matchbook makes a good substitute for an oilstone when sharpening your modeling knives. When the stone isn't handy, you can bring back that like-new edge by rubbing blade across this abrasive strip

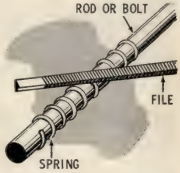


FOR MORE GRIP when applying plaster or stucco to a smooth surface, install a number of protruding staples on the surface. Just place a thickness of wood or metal under the gun when you're driving the staples

GROOVED RULER attached to the edge of your workbench is a handy accessory for measuring dowels and holding them while sawing. It also serves as a pencil holder and lip to keep objects from rolling off bench

YOU CAN MODIFY taps to thread deep holes in wood, plastic or soft metals by grinding the shank of the tap to a smaller diameter than the thread portion. This weakens tap a bit, so use it only in soft materials

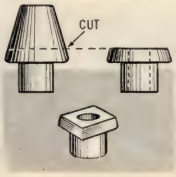
MANY PEOPLE have the bad habit of yanking the power cord to unplug an appliance, and this puts a strain on the connection inside the plug. To prevent damage to the plug, fold cord over plug and tape it securely



TO SHORTEN a spring that is too long for your purposes, just slip it over a bolt or rod large enough to fit snugly inside and use a file to cut at the desired spot. It keeps spring from twisting while you're cutting it

EXCELLENT TOOL for pulling stubborn fence staples is an old square-shanked gate hook. Tap the point in behind the staple to start it, then pry it out using the leverage you can apply through the long arm of hook

NEED A GROMMET in a hurry? You can improvise one from a removable pencil eraser by cutting off the upper portion of the head, leaving just enough to serve as a lip. The neck can also be shortened, if necessary



ADD MORE FOOT POWER to spades, shovels and spading forks by welding a short section of angle iron to the upper edge. This provides plenty of pushing surface for your foot and makes the digging job a lot less tiring

New for Camera Buffs

EASIER VIEWING of enlarger image is made possible by Accura enlarger foot switch. You plug the switch into the wall outlet, then plug enlarger and safelight into the switch. Depressing the switch turns enlarger on, safelight off, so you can view the image without interference from the safelight. Price: $9.95. Accura, Ltd., 708 Byron Ave., Franklin Sq., N.Y.

•

ONE OF SEVERAL attachments for the Combi-500 CdS exposure meter is a device for reading from the ground glass. Thus, by determining exactly how much light is reaching the film from each area of the subject, you may compute an exposure and development combination that will give you the exact contrast gradation desired on the final print. Meter sells for $145 with case. Attachment lists at $14.95. Scopus, Incorporated, 257 Park Avenue S., New York, N.Y.

•

NARROW ANGLE OF ACCEPTANCE (9 deg.) of the Viewmeter 9 makes it ideal for telephoto photography or for quick readings of small areas of the subject. You aim the meter by looking through an eyepiece and centering a bright circle over the subject. Particularly useful when snapping backlit subjects. The scale of this sensitive CdS meter reads from ASA 6 to 3200 and speeds of 2 hours to 1/8000th sec. $54.95 from Minolta, 200 Park Ave. S., N.Y., N.Y.

•

BRING 'EM IN CLOSE with the 800-mm Tele-Amitar lens. It is so long, it can be disassembled for carrying. Apertures range from F:8 to F:32. Ranges calibrated in both feet and meters. Tripod socket is located at center of gravity for maximum stability. Despite its large size, lens weighs only 7 lbs., 4 oz. Fits most 35-mm single-lens reflexes. $197.75 from Sterling-Howard, 236 South Station, Yonkers, New York 10705

Underwater Camera Case

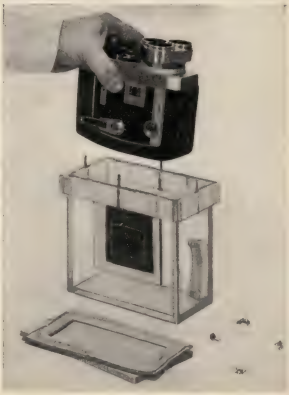
By Hank Clark

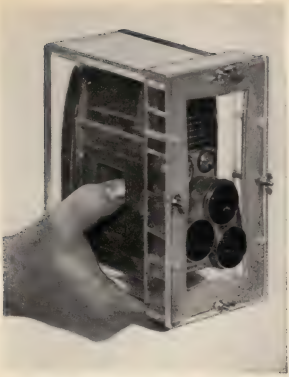
I WAS SCUBA DIVING on a hot July afternoon when I became intrigued with the idea of making some underwater movies. At first, constructing a watertight housing for my camera seemed like a pretty tall order, but after drawing up a few rough sketches I realized that a simple, plastic box would do the job.

I'm a rather inexperienced diver—a cautious 20 feet is just about as deep as I care to venture. With that in mind I constructed the box from ¼-in. acrylic plastic and found it amply strong for the pressure at that depth. If you plan to make some really deep dives with your camera, it would be better to use either ⅜ or ½-in. plastic.

The waterproof box detailed here is dimensioned for my 8-mm Bell & Howell turret rig. Cameras of different size and design will, of course, require adaptation of the plans. An opening cut in the side of the box provides handy access to my camera's release button. A small square of thin rubber cut from a bicycle inner tube or patch kit is bedded in epoxy or Pliobond cement to seal the opening. It is im-

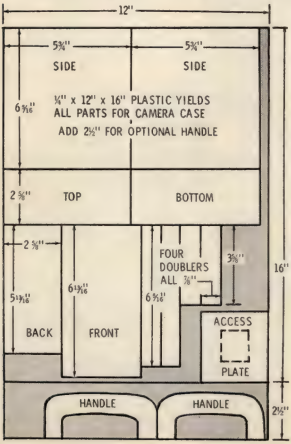
AFTER PLACING movie camera inside the housing, snug down wingnuts to compress rubber gasket





THE RELEASE BUTTON is operated by pressing on a flexible piece of rubber cemented to the housing with either Goodyear Plioband adhesive or epoxy

CUTTING DIAGRAM shown below should be followed exactly. Optional handle is cut in two pieces which are then cemented together to form a double thickness



portant to choose a flexible piece of rubber for this purpose.

The best way to cut the plastic is with a fine-toothed circular saw blade. In a pinch, a 12-pt. hand saw may be used. Epoxy cement does a fine job of bonding the plastic parts together but it is absolutely essential to roughen the mating edges or surfaces of the plastic before applying the epoxy. Rubbing with a coarse grade of sandpaper will do the trick. Though epoxy is thick enough to fill minor nicks and other imperfections in the edges, ideally, each edge should be jointed after sawing. If your shop equipment doesn't include a jointer, the simple sanding block shown in the drawing will true the edges quite accurately.

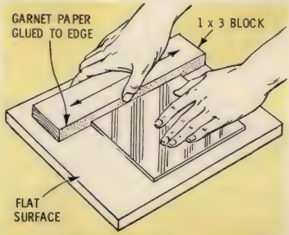
Epoxy cement holds with a bulldog grip, so to guard against epoxy oozing from joints and bonding the plastic case to the workbench top, be sure to lay down a sheet of wax paper before starting work.

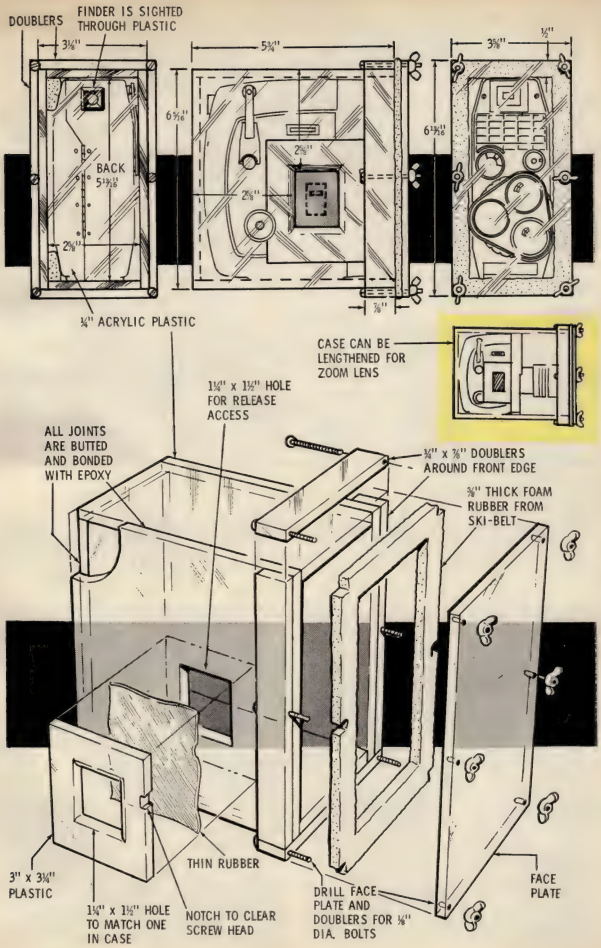
Drilling the faceplate and doublers for ⅛-in. bolts should be done with care. To assure accurate alignment of the holes, it is best to clamp the faceplate to the doublers and drill through both in one operation. After the holes have been drilled, pass the bolts through and anchor their heads in place with epoxy.

The ⅜-in. foam-rubber gasket that fits underneath the faceplate provides a watertight seal when the wingnuts are tightened sufficiently to compress the gasket to a thickness of about 3/16 in. As a precaution, test the empty box under water.

If desired, two accessories may be added: a double-thick handle and a wire frame viewfinder. The handle will help you keep a firm grip on the case. The finder is necessary only if you find that your face mask makes it awkward to sight through the camera's built-in viewfinder. ★★★

GARNET PAPER wrapped around a 1 x 3-in. block is moved back and forth against the plastic to true edges after the piece has been cut to dimension



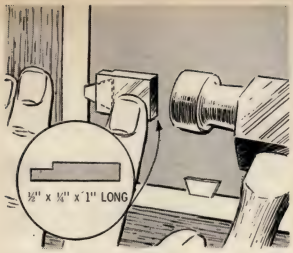

DOUBLERS
FINDER IS SIGHTED THROUGH PLASTIC
3 1/16"
5 3/4"
3 5/8"
1/4"
6 9/16"
6 13/16"
BACK
5 13/16"
2 5/8"
2 5/8"
2 5/8"
7/8"
1/4" ACRYLIC PLASTIC
CASE CAN BE LENGTHENED FOR ZOOM LENS
1 1/4" x 1 1/2" HOLE FOR RELEASE ACCESS
ALL JOINTS ARE BUTTED AND BONDED WITH EPOXY
1/4" x 7/8" DOUBLERS AROUND FRONT EDGE
3/8" THICK FOAM RUBBER FROM SKI-BELT
3" x 3 1/4" PLASTIC
THIN RUBBER
1 1/4" x 1 1/2" HOLE TO MATCH ONE IN CASE
NOTCH TO CLEAR SCREW HEAD
DRILL FACE PLATE AND DOUBLERS FOR 1/8" DIA. BOLTS
FACE PLATE

ROTARY MOWER that's ready for the junk heap can be converted into a heavy-duty lawn cart for hauling stones, dirt and other loads by removing the engine and replacing it with a box bolted to mower body. Run bolts through holes used to mount the engine

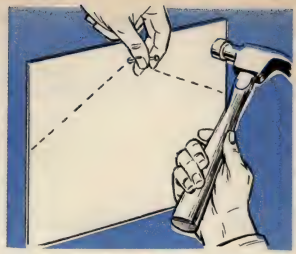
Solving Home Problems

OLD-FASHIONED eyewash can be made by dissolving a half teaspoonful of clean salt in a pint of warm water. It's fine for cleansing and soothing eyes after removal of an irritating foreign particle

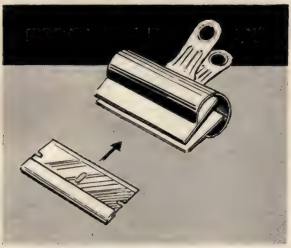
PUSH BAR installed vertically on bottom section of screen door protects screen by giving small children something to push against when opening door. Mount with countersunk screws and finish to match door



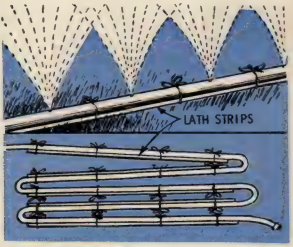
BETTER THAN THE DRIVER that comes with glazier points, this one holds the point flat against the glass and keeps it from bending up when being tapped in place. It's simply a notched piece of brass



FOOLPROOF method of hanging a picture exactly where you want it takes only a couple of minutes. Cut cardboard to size of the frame, punch hole where hook will fall when wire is extended and mark wall

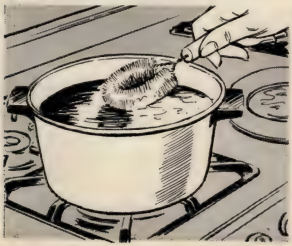


SAFETY HOLDER for a single-edge razor blade used in your office or shop is just a paper clamp. Insert blade between jaws of clamp and it will not only guard against accidental cuts but protect blade edge

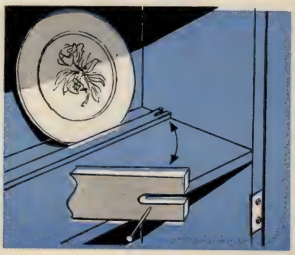


SOAKER HOSE will lie flat and stay right side up if you tie it to short lengths of ordinary wood lath. Allow about 6 in. between lath sections so the hose can be folded flat for compact storage

EFFICIENT SKIMMER for removing the scum that forms when making jelly or preserves is a fresh, clean vegetable brush. Just be sure to rinse the brush thoroughly in warm water between skimming operations

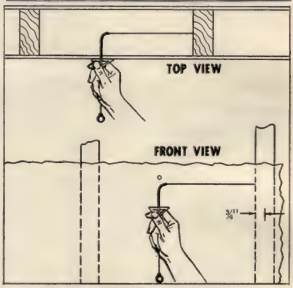


REMOVABLE retaining strip for holding plates and platters upright against the back of a shelf can be made by notching the ends of a thin strip of wood to slip over two projecting brads driven into shelf



Shopping for Tools

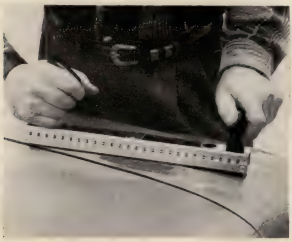
Two-Speed Belt Sander offers a choice of 1700 sanding ft. per minute (sfpm) for rough work and 1400 sfpm for finishing. In addition, the motor is located between the belt pulleys, instead of on top, in order to reduce accidental tipping and gouging of the work. The Model 840 sells for $110 and is made by Black & Decker Manufacturing Co., Towson 4, Md.

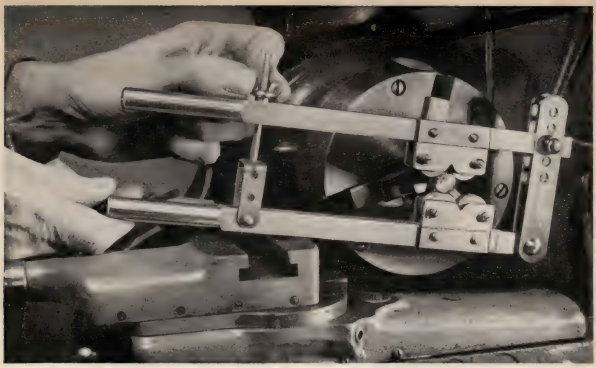


Finding Studs is a simple matter with this wire probe. You insert a curved tube through a hole in the wall surface (drawing, right) and push a wire through the tube until you feel a stud. You then withdraw the device and lay it on the wall surface as shown. A stud center lies ¾ in. from the end of the wire. Costs 79¢ from T. E. Morrison, 2658 Butler Ave., Los Angeles, Calif.

Extra Hard Drills, for removing broken taps, repairing molds, spotting holes in hard steel, etc., have full-length back tapers to prevent binding. Available in sizes from .078 to .500, at prices up to $10.00. Set of 8 (bottom right) costs $39.95 and includes sizes from 3/32 to ½ in. Foster Supplies Company, 6122 Milwaukee Avenue, Chicago, Ill.

Pro-File (below) is designed for dressing down auto body putty. Manufacturer says it cuts fully cured putty, thus eliminating need to shape the putty while still soft. Blades each have four cutting edges, which are rotated for longer life. Costs $16.19 plus postage, from Hopkins Mfg., 428 Peyton, Emporia, Kan.





"Nutcracker" Knurler

By Walter E. Burton

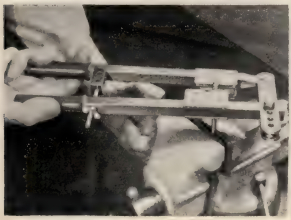
WITH THIS HAND-HELD KNURLER you can do straight or diagonal knurling, using one, two or three knurls at a time, on rods, tubes, knobs, etc., mounted in a lathe, drill press, portable electric drill, bench vise or even in final position on a machine.

Its normal capacity is about 3/16 to 2-in. diameter. However, by using smaller knurls and rollers closer together, somewhat smaller diameters could be accommodated, and by increasing lengths of the connector strips, larger diameters could be knurled.

The tool uses 3/4-in. knurls 3/8 in. wide, together with soft back-up rollers. Knurls are obtainable through most hardware dealers and generally come in pairs, either straight or diagonal, in fine, medium and coarse cuts. Straight knurls emboss longitudinal grooves parallel to the axis of the work. Diagonal ones produce diagonal grooves when used singly, diamond patterns when used in multiple. The knurls used in the original were Armstrong's No. 8275 (straight) and No. 8225—right and left (diagonal).

Chief material required for this hand

THIS HAND-HELD MODEL also can be used to knurl material held in a vise simply by placing the knurler around work, tightening the clamp screw and rotating

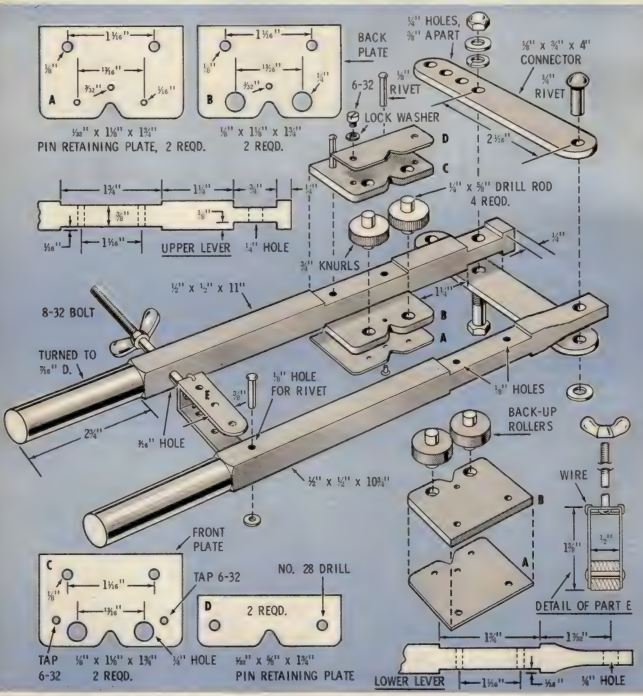


WHEN KNURLING material on a drill press, knurler is held so one handle is steadied against column. The drill press should be operated at slow speed

FIRST STEP in machining the levers is to turn down one end of each ½ in.-sq. bar to diameter of 7/16 in.

knurler is mild steel—about 24 in. of ½ in. x ½ in. bar, 9 in. of ⅛ in. x ¾ in. strip and about 8 in. of ⅛ in. x 1⅛ in. strip or plate. Ground flat stock can be substituted for the ⅛-in. strip, if desired.

The two levers, or arms, differ slightly in length. The upper lever is notched to produce a rigid right-angle joint between it and the two strips that connect the lever ends. You can cut both these notches and the shallower ones for the knurl-holder plates by milling, shaping, or filing. Depths of the plate recesses should be such that knurls have clearance to turn freely. For ⅜-in. knurls, you'll find ⅛-in. recesses provide sufficient clearance.



Outer ends of the levers are machined round to ½-in. diameter, to serve as handles. Rubber or plastic grips may be added, or pieces of plastic garden hose can be used as grips. Just heat the hose and handles before assembly with an infrared lamp or other means, so the plastic will soften and conform to the handle shape.

Two steel connector strips are pivot-joined to the lower lever with a ¼-in. rivet. Toward the opposite end of each strip is a series of ¼-in. holes permitting adjustment of the separation between the levers in order to accommodate various diameters of work. If you wish, slots can be used instead of a series of holes. A ¼-in. bolt, with cap nut for a more finished appearance, fastens the connectors to the upper lever.

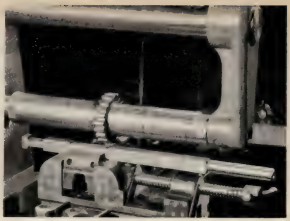
The knurl holders are pairs of ⅛-in. steel plates between which knurls or back-up rollers are installed. One pair of plates is offset along its lever (with respect to the other pair) a distance equivalent to one half the spacing between knurl centers in a pair. Thus, one knurl or roller in each holder is positioned midway between the two knurls or rollers in the other holder. Center-to-center knurl spacing in the tool shown is 13/16 in., so the offset is 13/32 in.

For convenience, plates are marked "front" and "back" on the drawing. Each plate is provided with a thin (about 1/32 in.) piece whose purpose is to hold the ¼-in. pins that serve as knurl axles in position. The cover for each back plate is the same size as the plate, and is riveted permanently to it. The front cover is only half as wide and is held by two 6-32 machine screws and lock washers, so it can be removed when knurls are to be changed.

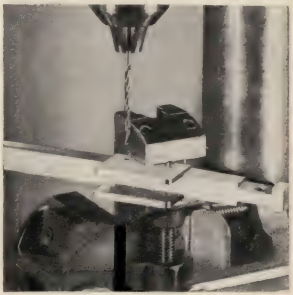
To assure alignment of knurl-pin holes, rivet the two knurl-holding plates temporarily to each lever before drilling the ¼-in. holes for the pins. Later, rivet them permanently, with the back covers in position. Each back cover has a small hole opposite each pin end, so a punch can be used to force out stubborn pins.

The clamp screw is an arrangement for applying constant pressure other than by squeezing with the hands. The screw-and-yoke arrangement shown consists of a U-shaped steel strip pivoted to the lower lever with a 8-32 or slightly larger bolt extending from it, and passing through a hole in the upper lever. A wire through the yoke and screw-head slot prevents the screw from turning when the wing nut is turned. The 2½-in. bolt shown is adequate for the small- and medium-diameter work for which this particular knurler was intended. For larger work a length of 4 in. or so is desirable.

The tool holds two pairs of knurls or

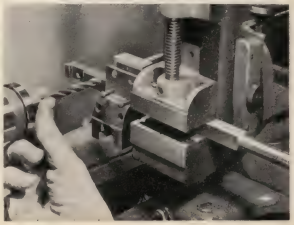


AFTER MILLING recesses for the connectors near the lever end, mill recesses for knurl-holder plates, positioning by measuring from bolt hole in each. End recesses are made ⅛ in. deep, others 1/16 in.

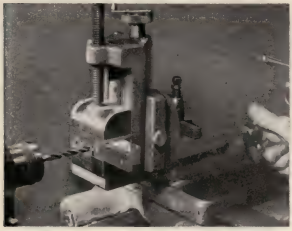


WHEN DRILLING holes for the rivets used to mount the knurler-holder plates, align the plates on the lever and drill one hole, then slip a rivet into it to hold them in place while drilling the second

HOLES FOR KNURL PINS can be drilled with the milling attachment in your lathe or on your drill press. However, positioning is slightly easier on the lathe

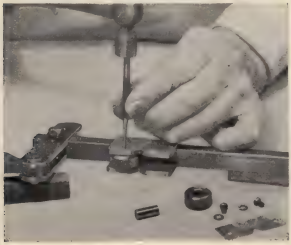


AFTER CUTTING the rounded notches in the knurl-holder plates and pin-retaining plates, stack them and clamp them in a vise for finish-filing. Once this is done, the plates can be riveted to the levers



DRILL BOTH connectors simultaneously in the milling attachment of your lathe. (While five adjustment holes are shown in this photo, it was later determined that only four holes would be required)

TO CHANGE KNURLS, remove the front pin-retaining plate and drive out the pins by inserting a punch through the holes in the rear pin-retaining plate. The same procedure is used to replace worn rollers

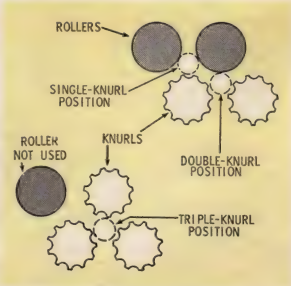


rollers. If you are using three knurls of a kind simultaneously, install two in one holder and one opposite them in the other. If you intend to use one or two knurls at a time, install two knurls in one holder and two back-up rollers in the other. Then merely switch from one position to the other, as required, for single or double-knurl patterns, as sketched below.

The back-up rollers are made of relatively soft material that will not flatten the knurled pattern as fast as it is formed. Each roller is machined to the same size as a knurl. The rollers shown were turned from a phenol-formaldehyde resin that happened to be in the shop scrap box. They have worked well with aluminum, brass and steel, and do not appear to wear away at an excessive rate. Of course, some wearing away can be expected, so it's a good idea to make up spare rollers for quick replacements. Other materials that might be used for rollers (depending somewhat on the materials to be knurled) include aluminum, various plastics and steel faced with a softer material.

Always lubricate the knurls, rollers and work, as in conventional machine knurling. Use slow speeds when knurling work on a lathe or other power tool, and steady the knurler against some fixed part of the machine or the bench. Longitudinal movement of the knurler to produce a knurler band wider than the knurl length may require considerable "push." When the work is done on a lathe, such push can be provided by the lathe carriage and toolpost.

One way to use the tool for knurling without power is to clamp the work in a vise and rotate the knurler by hand, much as you would manipulate a die stock. Another is to clamp the knurler in a vise and grasp the work piece in a chuck wrench, brace or hand drill. ★★★



Hidden Weight Locks Cistern

Many older homes and farms have old-fashioned cisterns for collecting and storing rain water, and whether these are still in use or not, there is the ever-present danger of small children removing the cover and falling inside. One way of eliminating this hazard is to suspend a pail of stones, a cement block or other heavy weight from under the cover. This hidden weight will discourage children from lifting the cistern cover.—*G. E. Hendrickson*

Dirty light bulbs mean dim lights, so when the bulbs used in barn or garage become dirty, wipe with a soapy cloth and dry well. Don't dunk them for this may loosen the cement holding base to glass.

Tire Swing for Tots

Designed for very young children, the modern tire swing at left was made by cutting out a discarded automobile tire and turning it inside out so that the tread formed the seat. It boasts a seat back for safety, plus plenty of places for small hands to hang on tight. Cutting will be a great deal easier if you use a razor-sharp knife which has been heated. Ideally, you should alternate cutting with two knives, so that one can be heating while the other is in use. A hot, sharp blade will cut through the heaviest tire, but be careful about overheating, for this can ruin the knife.
—*Ben Brown*

NEXT MONTH IN SHOP AND CRAFTS

★ **TREE HOUSES.** Summer is almost here, and as far as most kids are concerned, that means tree-climbing time. Next month *PM* brings you plans for a bevy of tree-top retreats that will delight any youngster. For those who don't have a shady elm in the back yard, we're also including a number of "pole houses"—sturdy little cabins that sit high above the ground on stilts, like a ranger's lookout tower. You'll find them all in the June issue

★ **SEPTIC-TANK CARE.** Few homeowners give much thought to their septic systems until something goes wrong, and then they find it hard to think of anything else. If you want to know the complete story on how a septic system works and what you can do to avoid problems with it, pick up a copy of the June *PM*. It debunks many myths about clogging and killing bacteria, but also include warnings on little-known sources of trouble. Don't miss it

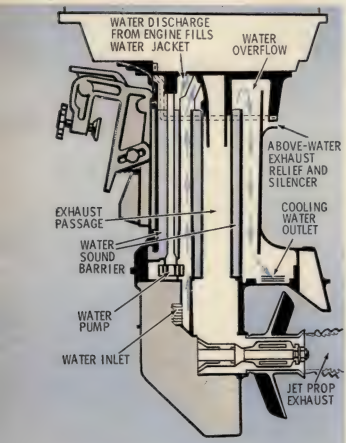
★ **PATIO LOUNGER.** A rugged piece of outdoor furniture, this easy-to-build unit consists of two lazy-living seats with a roomy table between, all built into a long lounge frame with wheels at one end for moving it around the patio. Whether you add the optional sun umbrella or not, it's sure to enhance your enjoyment of outdoor living this summer

★ **FEATHERWEIGHT KAYAK.** An Eskimo might take issue with us about that name, but it's the best word we can find to describe this little 24-lb. boat. Carved from a single block of foam mounted on a plywood bottom, it's virtually unsinkable. You can "build" this lightweight for about $36 by following the plans which will appear in next month's issue of *PM*

Troubleshooting Your

When that warning light flashes on and your engine's healthy whine drops off to a complaining drone, you're in trouble. But whether it's pump trouble or a bad thermostat, chances are you can fix it yourself

By Henry B. Notrom



WATER JACKET surrounds exhaust passage on the '65 Mercs, above, acting as noise suppressor. After unbolting lower unit, below, slide it off the motor

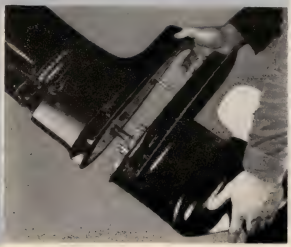
"OUTBOARD ENGINE overheating is a widespread problem," according to Tom Smith of Vansen Boats, Inc., Plainfield, N.J. Basing this statement on the number of motors that turn up in his shop with problems caused by overheating, he adds the encouraging information that, "In most cases, the man who owns a water-cooled motor can handle cooling-system repairs himself."

This advice from a pro brings up two important questions: (1) How can you tell if your engine is overheating or on the verge of overheating; (2) What causes overheating and how can you pinpoint the trouble.

The first one's easy. Many engines have warning lights which flash the news that your engine's running too hot. All, however, have a cooling system outlet, usually located somewhere in the upper case, and the water that cools your engine should be coming from these holes if the system is functioning properly.

Another foolproof indicator is the sound of the engine. An engine that's overheating will begin to run slower, and this dropoff in rpm resembles the sound of slowly throttling back.

As soon as there's any indication of pos-



SHIFT LINKAGE on Mercs is spring-loaded and must be locked in forward gear before lower unit is removed. Otherwise, you'll run into problems later

Outboard's Cooling System

sible overheating, *cut your engine.* Tilt the lower unit out of the water and check the water intake for seaweed or other obstructions, such as plastic bags (that people persist in throwing overboard). Clear the obstruction, re-start the engine and check the cooling-system outlet holes. If water's squirting out, you've solved the problem.

It's possible that in tilting the engine up out of the water, an obstruction may fall off before you see it. This could be misleading, so make sure you check the outlet holes after re-starting.

If the engine still shows signs of overheating, cut it and begin rowing. Never chance running an engine like this—it'll burn up in quick time.

"Ninety percent of the time," Smith claims, "overheating troubles are caused by a bad water impeller. However, there are other things that should be checked before ripping down the lower unit." As other possible causes, he includes engine timing that's too far advanced, improper fuel mixture and, in those engines that have them, a faulty thermostat.

Timing is probably the least common cause of overheating, and while checking it isn't really difficult, a description of what is involved would require too much space to be included here. As for the fuel mixture, so much has been written on this that the only thing to do is to repeat those two old precautions: *measure* the oil to make sure you have the proper oil-gas proportions, and *mix it thoroughly.*

A bad thermostat, though, is easy to pinpoint. Simply remove the thermostat housing that sits on top of the head, remove the thermostat, rebolt the housing to the head and start the engine (in the water, of course). If a bad thermostat was preventing circulation, water will now circulate and come out the outlet holes. If that's the case, put in a new thermostat.

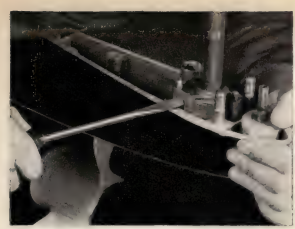
Failing all else, the water pump will have to be looked at, and chances are, replaced. Cost of a new pump, by the way, runs from about $2 to $4, depending on the motor.

Replacing the water pump isn't difficult if it's mounted on top of the lower unit, which is the set-up in most engines. Those engines that have the pump further up in the exhaust housing should not be tackled by anyone other than a qualified serviceman. This takes special tools and requires resetting the bearings.

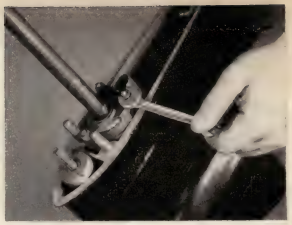
To begin the job, remove all nuts and

THERMOSTAT is located in the head and relatively easy to remove for checking. Evinrudes and Johnsons are equipped with thermostats, though Mercs aren't

SHIFT ROD mechanism on this Gale is located under a cover plate on the housing. You'll have to loosen this before lower unit can be removed from motor



IN ORDER TO CHECK the condition of the impeller, you must take off the housing which covers it. If the nuts are frozen, use penetrating oil and heat



ONCE YOU'VE REMOVED nuts holding housing, there's a good chance you'll have to pry up the impeller cover since it will probably bind in place

bolts that hold the lower unit in place. (The number and location of these vary from engine to engine.)

If you have a Mercury engine, the shift lever should be moved to the forward gear before disengaging the lower unit. This is a spring-loaded shift set-up. By keeping the shift in a forward gear, the linkage located in the lower unit and the entire shift mechanism will be locked in place and won't move unless you accidentally trip it. This'll make it easy to reassemble when you're done, since all you have to do is slip the lower unit back into position to make everything mesh.

If the shift is in any other position, the spring can slip and mess up the linkage position. You'll then have a job of repositioning the linkage to get it aligned for remating with the shift mechanism.

Shift position doesn't matter with most other engines since these have a shift-rod setup. However, you must disconnect the lower shift rod before you can drop the lower unit. To do this, locate the cover plate on the exhaust housing and remove it. With some engines you'll have another cover plate beneath the top one. If you do, remove that, too.

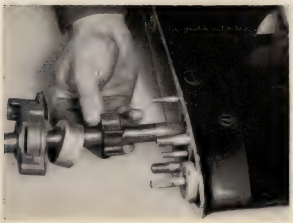
You'll see two bolts which connect the lower shift rod to the upper. All you're concerned with is the lower bolt. Loosen it until the lower shift rod drops in order to remove the lower unit. When it comes time to reassemble the unit, make sure the lower rod is butted firmly against the upper, and the holding bolt is tight.

Once you've removed the lower unit, take it over to the workbench and remove the screws of the water pump housing. These screws might bind and refuse to turn, especially if the engine's been used in salt water, but don't force them because they can snap off. Instead, use heat and penetrating oil to loosen them up.

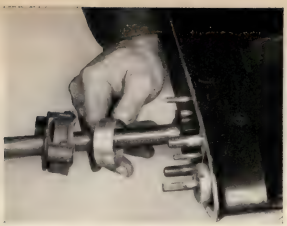
Run the flame from a propane torch over the bolts and squirt some penetrating oil in around the threads, then try to loosen them. If they don't loosen on the first try, repeat the heat and oil treatment.

With the bolts off the housing, chances are you'll have to pry up on the impeller

SLIP IMPELLER up the shaft to make inspection easier. When replacing it, make sure that the slotted bushing inside mates to the flange located on the shaft



IMPELLER BLADES are made of synthetic rubber. They should be firm and straight for top efficiency. If you discover that blades are bent, replace impeller



SLIDE HOUSING and water impeller cover up the shaft away from the impeller and check the cover over carefully for wear or pitting on inner surfaces

cover to get it off since it tends to stick.

Once the impeller is exposed, inspect its blades. These have to be perfectly straight, but in time they may bend (they're made of synthetic rubber) and give rise to cooling troubles, such bends come about because of the movement of the impeller against its cover as the impeller spins to cool your engine.

Then slide the impeller off and inspect the impeller plate beneath. This seldom gets damaged, but if it looks worn or pitted, replace it. To reassemble, slide the impeller back on the shaft and into position. The bushing inside the impeller is slotted, so fit this slot over the small flange on the shaft to firmly seat the part.

Check the impeller cover before installing it, and if it's worn or pitted inside, replace it. Also, it's always a good idea to replace old gaskets with new ones.

There's one other spot that could be the cause of engine overheating, but only if the engine's been running in salt water. It would be wise to check the rubber grommet inside the water tube housing and the housing itself.

Every engine has at least two of these housings, equipped with grommets. They're located in the lower unit, on or adjacent to the water pump. However, in every engine, at least one is located in the upper unit. Fortunately, the ones in the lower unit go bad more frequently than their counterparts above.

We say "fortunately," because if the one in the upper unit is damaged, it means the engine will have to be torn down to get at it. This is not a job for the average outboard owner, and the only way to tell positively whether the upper unit water-tube jacket's causing the problem is to run the engine after you've repaired the water pump. If the engine still overheats, your next stop is a service shop. ★★★

Outboard Clinic

Q My 1963 Mercury Model 110 suddenly developed a case of misfire that I've not been able to track down. Has anyone else complained of this?—L.T., Wisconsin

A There's been a new coil issued by the manufacturer to replace the old one which had a way of causing misfiring, and other ignition problems. The new coil (part number A-398-2545A1) is to go on 1963 and 1964 Models 39, 60, 110, 200 and 350, and the job is outlined in Service Bulletin 4, Section IV, dated September 18, 1964. The work isn't particularly difficult, but can't be tackled without the instructions in the service bulletin. This should dissuade you from bringing the engine to your dealer, though, since the work's to be done on a no-charge basis, according to the service bulletin.

Q My Johnson 1960 75 seems awfully hard to steer. Since I'm a new outboard owner (I just bought this engine used), can you give me a hint?—J.S., Maine

A If your problem's caused by running the engine in the wrong tilt position or improper trimming of the boat, I'm not going to be able to help you. Due to space limitations, this column must be limited to engine problems only, rather than those concerning hulls, trim or general boating. However, there was an engineering change issued by the company for this model that had to do with steering. It seems that the original exhaust outlet was so long that it impeded handling. A new outlet, much trimmer, was issued and proved to solve a lot of problems. But let it be understood that not even the new outlet will help unless tilt position and trim are correct.

As a service to the readers of *POPULAR MECHANICS* in solving problems relating to their outboard engines, you are invited to submit your questions to this column. All questions will be answered, either in the column or by mail. Address Outboard Clinic, Popular Mechanics Magazine, 575 Lexington Avenue, New York, New York 10022 and enclose a 5-cent stamp.

Get All the Channels— Erect a Fringe-Area Antenna

Tired of poor TV reception and stopped by the new antenna's price? Do it yourself. It's not easy, but think of those bright new pictures

By Larry Steckler

TIRED OF SNOWDRIFTS obscuring your TV pictures? Annoyed with ghosts chasing each other across the screen? Suffering with weak and pale hard-to-watch viewing? Chances are you need a new roof antenna to put an end to these problems and bring back those stations you haven't been able to enjoy lately.

If you're more than 50 miles from the nearest TV transmitter, a simple antenna just won't do. For good reception you need a really sensitive highly-directive antenna mounted on a tall mast.

We tackled this problem recently at a summer home in Southampton, Long Island, about 100 miles from New York City in a relatively difficult reception area. Our solution was to erect a high-gain super directional antenna atop a 20-foot mast attached to a sloping roof some 32 feet above the ground. This gave us an actual antenna height of more than 50 feet.

First steps called for selecting an antenna and mounting hardware. We chose a Channel-Master Crossfire for the antenna and a combination of mounting hardware that included a two-section 20-foot mast, tripod mount and base mount, ground rod, standoff insulators, lightning arrester, turnbuckles, guy wire, ground wire and lead-in wire.

Our choice of mounting hardware was predicated by the location. Normally either the trinod mount or the base mount would be used to hold the mast in place. But because of the possibility of high winds we

UNFOLDING THE ANTENNA is a fast and reasonably easy task. Make sure all antenna elements are firmly locked open and straight. If possible, do this on roof

GUY WIRES must be attached firmly so they will not slip and loosen at any time after the antenna is installed. Don't be afraid to put a real test load on them

ASSEMBLED, erected and in action, a fringe-area antenna is a most impressive sight. Six guy wires are used, three at the ten-foot level and three more from the antenna support bracket on the mast, to support the structure

CONNECT ANTENNA LEADS to antenna terminals while you're still on the ground and can reach them. Coat with spray-on plastic to protect against corrosion

START MOUNTING BOLTS with a hammer. Be sure they are going into the rafters for a firm solid grip. Cover with silicone rubber or tar to prevent leaks

THE GROUND WIRE must be firmly attached to the antenna mast. Wrap several turns of wire around the mast and tie carefully. Other end goes to ground rod

used both. A hurricane which hit just a few months later proved us right. Our installation held while many others in the area tumbled before the high winds.

We took as many basic steps as possible while still on the ground. The sloped roof would have made opening the antenna and hooking up guy wires rather difficult. If a flat roof had been the work area, all this would have been done on the roof. First we laid out all the parts, cut guy wires to size and tied one end of each guy wire to the appropriate ring on the antenna mast. Next we folded the antenna open and attached it to the mast. Then lead-in wire was connected to the antenna terminals and run through the standoffs we mounted on the mast.

Next it was time to climb the extension ladder to the roof to make our basic preparations there. We picked a site atop the roof peak and selected positions for the antenna mounts and guy wire tiedowns. The trick here is to make sure that the mounting screws go into something solid so they won't pull loose later. This means you have to locate the roof rafters. Also, once you make a hole in that roof you must seal it up after the screw or whatever has been put into place. If you don't, you'll be looking at water stains on your ceilings after the first good rain. The easy way to do this is with a tube of silicone rubber. Just make sure you use enough to completely surround every screw or eye.

Once the antenna mounting brackets were fastened in place with lag screws, it was time to haul the antenna up on the roof. When handling an assembled antenna you can't be too careful. It's clumsy and slow work. Two men can make quick work of the job, however, if one guides the an-

ROOF ENDS of the guy wires are fastened to eye hooks screwed into the roof. Tie firmly. Later all slack will be taken up evenly with turnbuckles

STRAP-MOUNTED MAST STANDOFFS must be tight so they cannot slip after the installation is complete. This type standoff is preferred over snap-on types

tenna around obstructions with a line tied to the mast and handled from the ground while another man pulls the antenna up.

When working with rooftop antennas, watch out for nearby electric cables. More than one antenna installer has been fatally injured when the antenna contacted a nearby live line.

With the antenna on the roof we extended the mast to its full length. Then we tied down one guy wire from the top mast section. Pick the side that faces into the prevailing wind. This will hold the antenna in place while you get to the other guys, and tie the antenna down properly. We used guy wires at two levels on the mast. There are three guys at each level separated by 120 degrees. This gives uniform support. Always set one guy to face into the prevailing winds—the direction the wind most commonly comes from—to provide maximum support. In an area subject to extremes of wind, snow and ice you may need six guys at each level.

Now we were ready to raise the antenna and insert it into the tripod mount. This again was a two-man job to keep the antenna from falling. With the mast in the mount, we then tied down the remaining guy wires. Using the turnbuckles, all the lines were tightened evenly. You can check this by watching the mast. It should remain straight and vertical.

Once the antenna was in place we attached the remaining standoff to the mast and ran the lead-in wire through it. Then came the lightning arrester which is fastened to the mast by its mounting strap. The lead-in runs through it too. Should lightning strike the antenna, the arrester will prevent the bolt of electricity from following the lead-in down to your set and possibly doing extensive damage. The arrester grounds to the mast, so we used our length of ground wire to connect the mast to a 10-foot copper ground post.

Some readers may question our use of flat ribbon-type lead-in. But as we were in a quiet, relatively noise-free (electrical noise) area it was possible.

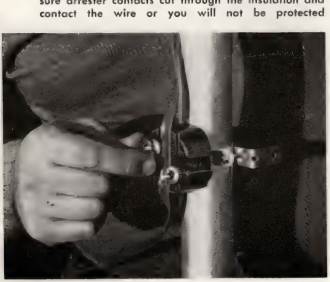
All that was left was to run the lead-in down the side of the house to the set and hook it up to the antenna terminals. Then final alignment adjustments were made by turning the antenna for the best pictures on all channels. A handy way to simplify this procedure is to use a portable TV in the yard where you can see it while rotating the antenna. If you've got a battery-powered TV, it can go right up on the roof with you. If you can't bring the TV out of the house, a "people chain" or CB radio can be used to relay instructions to the person rotating the mast.

In extreme fringe areas there are several accessories that can be added to the installation to make good reception possible. For example, in many areas you will want to receive TV programs that are originating from different cities located in different directions from your antenna site. An antenna rotator is the best bet here.

In some locations you may be too far from the TV station to get anything but snowy reception no matter what antenna you use. For greater sensitivity and less snow you can add a booster that will amplify the signal being received by your antenna to improve the picture.

Remember, no two antenna installations are exactly the same, but the general rules we have spelled out and the installation described here are typical and can be used as a guide for most installations. ★★★

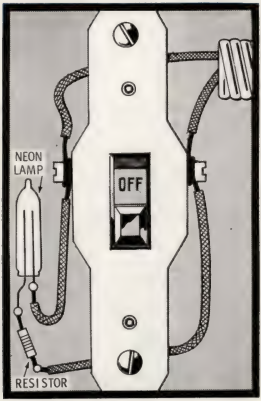
LEAD-IN runs through the lightning arrester. Make sure arrester contacts cut through the insulation and contact the wire or you will not be protected



COPPER GROUND ROD is hammered into the ground. Use the clamp on the rod to fasten the ground wire from antenna mast in place to complete grounding

A THIRD HAND FOR YOUR SOLDERING GUN can be handy whenever you're caught up in a tricky soldering job which has both your hands filled before you even reach for the "gun". You can make a third hand that will keep your soldering gun hot out of a piece of 14-gauge wire. Bend it into a clamp that fits over the handle and trigger as shown in the photograph. If your gun has only one heat, your clamp won't need the second step shown.—*Bruce Trump*

Electronic Kinks



RESISTIVE LOAD TO TEST YOUR CB RIG can be made from a few odds and ends. A right-angle coaxial connector and seven 1-watt carbon resistors are all you need. The group of resistors are connected in parallel from the skinned back inner conductor to shell of connector. End result is a 7-watt dummy load with a resistance of about 52 ohms. In use they won't get warm even after several minutes of testing.—*Elmer C. Carlson*

ADD A LIGHT TO YOUR LIGHT SWITCHES and stop groping around in the dark. Connect an NE-2 neon bulb in parallel with the switch. Connect a 200,000-ohm ¼-watt resistor in series with one of the bulb leads. Insulate all leads with tape. If the wall plate is plastic the glow can be seen through it. If the plate is metal drill a small hole and insert a small plastic jewel. When the switch is off, the lamp lights.—*Henry R. Rosenblatt*

In his hand
or yours...
Tools by
CHANNELLOCK®
get the job done easier...faster, year after year!
If you like the feel and performance of quality hand tools, your choice will be CHANNELLOCK. Drop forged of tough, high grade steel. Precision made in every detail. Beautifully finished. Built to last. Specify CHANNELLOCK . . . you'll be glad you did.
FREE Catalog showing complete line of hand tools . . . yours for the asking.
CHANNELLOCK, INC. Meadville, Pennsylvania
Formerly Champion DeArment Tool Co.

NEW from Du Pont

for every car with an automatic transmission

DOES TWO JOBS . . . All transmission fluids contain certain additives which wear out with use. Du Pont "T-Seal" is formulated to replace those worn-out additives and to revitalize the transmission fluid.

IT'S A SEALER . . . Du Pont "T-Seal" stops automatic transmission leaks by chemically reconditioning the hardened, leaking seals. Prevents leaks from occurring by keeping seals soft and pliable. Saves costly transmission overhauls.

IT'S A TUNE-UP . . . Du Pont "T-Seal" renews the efficiency of the transmission fluid itself. Prevents formation of harmful sludge and varnish which could damage precision-built transmission parts. Helps stop slippage and assure quiet, smooth shifting. Prolongs the life of the transmission.

Prevent automatic transmission problems before they start. Get Du Pont "T-Seal" now at service stations and auto supply stores everywhere.

Better Things for Better Living . . . through Chemistry DU PONT

EXCLUSIVE OFFER—Save up to $3.00 on a set of Classic 7 Cars "Matchbox" Series—Models of Yesteryear. See the Du Pont display and money-saving coupon where No. "7" products are sold.

More Luxury for Campers

(Continued from page 120)

of water rides above the car-topper, being warmed by the sun during the day. Tubular steel supports swing out from the sleeper to accommodate the canvas curtain and support the tank when in use. The Jiffy Port-a-Bath is a body brush that controls the gravity-flow of water from a storage tank above the bather. A large rubber mat catches all the water for tidy disposal. Only three quarts are required for a complete bath.

As the outdoor luxuries increase, so does the number of campers. There are about 7500 developed public and private campgrounds in the United States, but for

BEING PRIMED FOR STARTING, a new Coleman catalytic heater will maintain constant heat without fumes at below-freezing temperatures for 14 hours on 3 quarts of naphtha, white gas or a special fuel

the more popular areas such as Yellowstone or Yosemite you have to arrive early in the morning to avoid the "no vacancy" sign. To accommodate as many camping families as possible, the campsites in most national parks have been drastically cut in size, often jamming as many as 600 camps in an area planned for 300. There is constant expansion on both the state and federal level, but it is estimated that in five years 30 million Americans will be transporting the indoors to the outdoors.

The equipment has changed since the camping days of the famous foursome, but Edison would still have trouble finding thinking room. ★★★

Looking for a truly efficient big outboard, one that thrives in fresh or salt water and even shifts for itself?

This is it. The carefree, new 90 hp Golden Meteor II (a Johnson, of course!)

The new Golden Meteor II, with its new, straight-through induction system and 4-barrel carburetion, burns no more fuel than engines with significantly less horsepower.

Other members of the famous Johnson V-4 family include the two V-75 models (Electric and Electramatic) and the economical Electric V-60. Both the Electric V-75 and V-60 are available with a special high-thrust lower gear case for heavy loads.

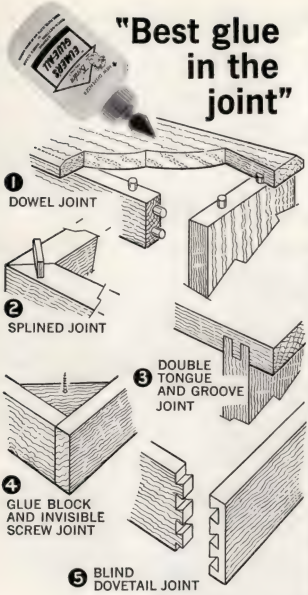
Exclusive Electramatic Drive! This new electromagnetic transmission is standard equipment on the V-90, and on one V-75 and one 40. It shifts electrically, works automatically as you move the throttle forward or back—control comes with motor at no extra cost.

2-year warranty on every '65 Sea-Horse! All 17 new Johnsons, from 3 to 90 hp, are backed by a 2-year warranty*. All are quiet. All use a new 50:1 gas-oil mix to halve oil costs and lengthen engine life importantly. For the right engine to fit your needs, see your Johnson dealer. He's in the Yellow Pages. Johnson Motors, 1932 Pershing Rd., Waukegan, Ill. Div. Outboard Marine Corp. In Canada: Johnson Motors, Peterborough, Ont.

*For 24 months after purchase, Johnson will replace, without cost to the original purchaser, any part of its manufacture which upon inspection proves to have failed in normal use due to faulty material or workmanship.

Another carefree Johnson ... first in dependability

"Best glue in the joint"



Fine furniture joints, like the five above, combine strong mechanical interlocks with maximum gluing areas. To give your woodworking projects even greater strength, use the best glue in the joint. That's ELMER'S GLUE-ALL—the versatile, clear-drying adhesive that comes in a convenient squeeze bottle with a non-clog dispenser top. To learn more about the many uses of this fine product—and those of ELMER'S other top-drawer glues—send us a stamped, self-addressed envelope, and ask for your free copy of "Elmer's Wood-Gluing Handbook": The Borden Chemical Company, 350 Madison Avenue, New York, N. Y. 10017.

THE BORDEN CHEMICAL COMPANY

One-Year Test of Corfam Shoes

(Continued from page 95)

that the same thing happens with leather.

Besides, if you're in the habit of stopping in at a bootblack's, you could save some money. Some businessmen get a shine every day. But even figuring every two and a half days—the frequency with which the cordovans shown with this article were polished—and at an average cost of 25 cents for a commercial shine, you would save about $35 a year.

If you're wondering what really accounts for Corfam's virtues, you won't learn much from the maker, that chemical giant, DuPont. Corfam is pretty much top-secret. Officials describe it as a "poromeric shoe upper material." Poromeric is a combination of "porous" and "polymer," which at least tells us it's a plastic.

After the plastic is formed, it is made into a sheet. Within the sheet, tiny plastic fibers are interlaced in complex patterns. The basic stock is gray and has a feel similar to that of a felt hat. One side of the material is still that way when it comes to the shoe manufacturer. The other side is smooth and glossy (except for a suede shoe) and has color. In other words, it looks pretty much like shoe leather.

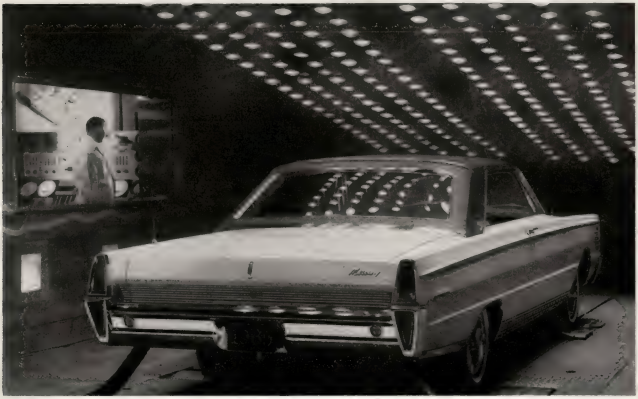
But Corfam has a built-in finish. And it doesn't soften in water, change color or lose its shape. These qualities make it ideal for certain types of shoes. At least one manufacturer has come out with a golf shoe that keeps your feet perfectly dry even though you've tramped through miles of grass heavy with morning dew.

But it's a rare "miracle" product that doesn't have at least one flaw. Corfam is no exception. It is so darn good at retaining its shape that it doesn't give or stretch. When you put on a Corfam shoe in the morning, it feels just about the way it did the day you bought it. In a few minutes, it will give slightly under the warm pressure of your foot—but not much. *In buying a pair, you must be sure that the shoes fit your feet exactly. Corfam shoes won't "break in" as leather shoes do.*

Finally, the sixty-four-dollar question: Would I buy another pair of Corfam shoes? The answer is yes. I think that's the only way I can keep my soccer-playing son properly shod. ★★★

As though the "house" didn't have enough going for it already, an electronic device has been developed for a Las Vegas casino that keeps a running account of the intake and payout of a group of slot machines—up to 1000 at a time. Gamblers, it seems, don't leave anything to chance.

Engine runs smoothly in desert heat! This test proves quality of the cooling and air-conditioning systems in Ford Motor Company cars. Keep the quality in your Ford-built car with Quality Car Care.



Ford Motor Company builds quality in– Quality Car Care keeps it in

QUALITY CAR CARE

Special equipment, like this stethoscope, helps Ford and Lincoln-Mercury Dealers to care for Ford-built cars. Add factory-trained mechanics, genuine parts, fair prices—that's Quality Car Care!

Now, a check on the road! Customer satisfaction is an important part of Quality Car Care, offered only by Ford and Lincoln-Mercury Dealers. They will make every effort to please you!

Only at FORD and LINCOLN-MERCURY DEALERS

Ford MOTOR COMPANY

RIDE WALT DISNEY'S MAGIC SKYWAY AT THE FORD MOTOR COMPANY PAVILION, NEW YORK WORLD'S FAIR

Structurally Sound House

(Continued from page 114)

If you see any of these faults, check the foundation for large cracks, or a possible gap where any two foundation walls meet. Also, hold a builder's level to the foundation walls to see if any are badly out of plumb. If it's a brick house, go outside and look for cracks in the exterior walls, especially over windows.

In evaluating a settlement problem, if you like the house, call in an engineer or contractor. He can tell you whether the settlement has ceased.

Watch Out for Water

Which brings us to a very common problem in old houses: water. The logical time to ferret out roof leaks and unwanted basement water is while looking for the structural flaws already mentioned. Signs of dampness on the rafters or underside of the roof sheathing may indicate repairs are needed on the chimney flashing, or the roof. Worse still, a new roof might be needed. Another sign would be peeling paint or water-stained ceilings and walls, even on the ground floor. At any of these signs, go outside and look at the condition of the roof shingles. Then ask the owner how old the roof is and what weight of shingles were used on it. A 250-pound asphalt roof should last 12 to 17 years in a hot zone, 17 to 25 years in a cool area.

In the basement, many old homes will have damp spots on the wall and/or small puddles on the floor, particularly where it meets the foundation wall. These indicate a minor problem that may be easily remedied (see *What You Can Do About Wet Basements,* page 154, October *PM*). A danger sign to be especially alert for is a water mark—like a giant bathtub ring—around the base of the foundation and on appliances, boiler, etc. This shows that water probably floods in during rainstorms. Correcting this can be costly, sometimes virtually impossible.

Since one of the homeowner's major problems is heat, look for insulation. Pre-World War II homes seldom have any except, possibly, in the attic, where three inches of rockwool or fiberglass would be the minimum to look for. A good test for wall insulation is, on a cold day, to feel the inside of an exterior wall. Then feel the surface of an interior wall. If both are almost the same temperature, the exterior wall is probably insulated. If the exterior wall is much colder, there's no insulation.

Now, regardless of how much insulation there may be, ask the owner to show you his heating bills for the past three years or more. Average them up and add the result to the mortgage and tax payments when figuring your budget.

Concerning the heating equipment itself, there are few checks a layman can make on its condition. However, find out how old the boiler is. You'll probably have to take the owner's word for this, but he may have a dated bill for the work. Now, look on the manufacturer's nameplate, near the base of the unit, to see if there's an indication of whether the boiler is cast iron or steel. The former generally lasts 30 to 40 years. The latter, 10 to 15 years. If the house has a forced warm-air furnace, ask the owner whether the heat exchanger, where combustion takes place, is guaranteed for five or ten years.

If possible, get the name of the firm which services the heating equipment and check with them on its condition. In some areas, the fuel supplier may give a free inspection.

If there's a separate hot-water heater, as opposed to one built into the heating boiler, its age and the material of the tank are also important. Galvanized steel should last two to six years. Glass-lined steel should last six to ten years and copper or monel should go for 15 to 20.

Hot Water Capacity Important

On the water heater's nameplate, incidentally, will be the unit's tank capacity. If the house has 1½ baths and no hot-water-using appliances other than a washing machine, the 40-gallon capacity should do for most families. Add 10 gallons for every appliance or bathroom. An electrical hot-water heater should be at least 66 gallons because of its low recovery rate.

Evaluating the plumbing is another difficult matter for the amateur. One thing you can do is learn if the plumbing is of iron pipe, or of copper or brass, which last much longer. A fast check is to hold a magnet to the pipes. It will cling to the iron, but won't respond to the other metals.

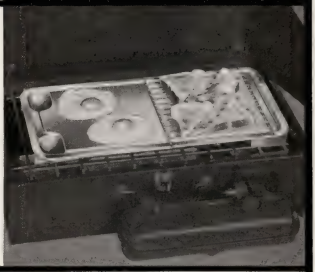
As you go through the kitchen and bathrooms, turn on all the faucets and flush the toilets. A sluggish flow of water indicates rust may have clogged the system (providing, of course, the local water pressure is okay). If the flow is sluggish, and you've been told the plumbing is brass or copper, there's probably a stray section or two of iron pipe somewhere—probably inside a wall. Examine all joints for signs of rust and leakage. Fortunately, although new plumbing can run into money, you can delay repairs until leakage or stoppage makes them necessary.

Finally, the wiring. Here, again, the average house hunter is at a disadvantage. And, to make matters worse, the home-

(Please turn to page 196)

Announcing...a new era in camp stove cookery.

NEW Coleman camp stove and accessory line!



NEW COLEMAN CAMP STOVE

A stylish new space-age contoured case distinguishes the all-new Coleman Camp Stove. Folded, with tank inside, it looks like smart airline luggage. Opened it features exclusive stainless steel Band-A-Blu burners—plus world-famous Coleman performance and dependability. Line includes 3-burner & 2-burner models.

NEW COLEMAN TOASTER-GRIDDLE-BROILER

Thick cast aluminum distributes heat evenly for grilling, frying. With wire grid it toasts, broils. Built-in drip catcher keeps foods dry, tasty. A must for every family. 18½" x 9¾" x 1½".

NEW COLEMAN CAMP STOVE PROTECTOR

Protects your Coleman stove, makes it look like trim airline luggage. Zip-closing, mildew-resisting canvas, neatly bound. For all Coleman stoves—a quality cover for a prestige product.

NEW COLEMAN HIGH STAND

Supports stove, cooler, etc., securely at table height, yet weighs under 3 lbs., folds down to 2½" x 2" x 26". Neat, bright, light aluminum.

NEW COLEMAN OVEN

Flip it open, latch it closed. Simplified instant setup. Bakes frozen foods, prepared rolls and biscuits, or your own treats better, more evenly. Large, convenient, side-hinged door. Packs flat for carrying.

See them at your Coleman dealer today!

Greatest Name in the Great Outdoors

Coleman

The Coleman Company, Inc.
Wichita, Kansas

New silicone rubber sealants stop the leaks and fix the things you couldn't fix before

because these General Electric adhesive/sealants won't crack, shrink, harden or leak

Caulk tub and tile

Repair rubber goods

Fix gutters, windows

Stop windshield leaks

Now you can caulk a bathtub, seal a storm window, stop a windshield leak, mend fabrics and restore 100 other things to usefulness yourself – before it costs you big money.

Developed in G-E chemical laboratories, these new silicone rubber adhesive-sealants are permanently flexible and just will not age.

Bathtub Seal stretches when tub settles. Pure white Bathtub Seal cannot shrink, dry out or wash away. With one application you will solve the constant problem of bathtub, sink and shower leaks. Reset loose tile, glue on towel racks and fixtures.

Clear Seal makes invisible repairs. Use transparent Clear Seal to mend tents, raincoats, leather goods, rubber boots, clothing. Seal basement cracks and aquariums. Mend plastic windows on convertibles.

Metal Seal looks like aluminum. It makes permanent, weather-proof repairs to storm windows, rain gutters and fixes small plumbing leaks.

Auto Seal repairs leaky windshields and convertible tops. Black Auto Seal will fix loose door gaskets, upholstery, even replace decorative chrome.

General Electric silicone rubber sealants will bond to glass, metal, wood, ceramic, fabric, leather, most rubber and plastics. They are available in most stores.

If you can't find them please tell us the name of the store where you tried to purchase them and send $1.95 per 3 oz. tube to Silicone Seal, P. O. Box 1300, Long Island City, N. Y. Make check or money order payable to Silicone Seal and specify the tube(s) you want by name.

GENERAL ELECTRIC

Structurally Sound House

(Continued from page 194)

owner probably knows little about it himself. However, before entering the house, see if the cable running to the house breaks into three wires before entering from the street. A three-wire entry usually means the house has 220-volt service.

Also, read the nameplates and schematic diagrams on the distribution panel to see if capacity is 30, 60 or 100 amps. Today 100 amps. is considered minimum. Some other tip-offs on inadequate wiring are a profusion of extension cords in the living areas, a fuse box containing only four fuses and the owner's use of, say, 30-amp. fuses in sockets meant for 15 or 20 amps.

If a house is over 35 years old, find out if the original wiring is still in use. If so, the wiring insulation is probably so dry as to constitute a fire hazard. A complete rewiring is called for. Cost could easily run from $600 to $1000.

Rely on Horse Sense

From this point on, the inspection of a used house is largely a matter of common sense. For example, you know that loose exterior shingles have to be re-nailed or replaced, and that peeling paint means a paint job. Water stains under the gutters indicated the gutters are clogged and/or leaking. Similarly, you know that broken plaster inside needs attention.

Now suppose you've examined a number of houses and have narrowed the field down to one, which you plan to buy.

When you put a binder on the house, make the sale conditional on an examination by an engineer-house inspector. For, no matter how careful you are, a pro can pick up defects that escape your layman's eye. An Ohio couple last year moved into a year-old house that seemed almost perfect. A competent inspector would have noticed that the house was built on filled-in land, and that the concrete floor slab had already started sagging. Before long, the sag reached two inches in spots, threatening to break the radiant heating pipes embedded in the concrete. As of this writing, the couple has spent almost $1000 on baseboard heaters to bypass the threatened pipes.

Where do you find an inspector? If none are listed in your classified phone book, under "Building Inspection Service," consult a bank or savings and loan to see who they use. Or, call an office of the Federal Housing Administration, or your city or state building department. Such agencies may hire outside inspectors, and often have a list of men they use. Inspection fees are usually reasonable. ★★★

Graham Hill wins the U.S. Grand Prix at Watkins Glen in a BRM sparked by silvery-plated Champions

Champions use Champions!
Year after year, the overwhelming majority of race winners choose Champion spark plugs – regardless of make of engine – because Champions deliver maximum performance. Why settle for less in your car?

DEPENDABLE CHAMPION SPARK PLUGS

To feel new power, instantly, install new Champions now and every 10,000 miles

No. C94

HYDE TOOLS
FOR THE MAN WITH
THE BUSY HANDS!

Double Header 2-in-1 putty knife tool removes old putty and special "V" blade applies smooth strip of putty, No. C94 $1.19 each. Five Way Styrene plaster patcher and joint knife. No. 26 $1.19 each.

No. 26

Touch-EE, the paint brush without bristles, made of polyurethane, for smooth finish, no messy hairs.
No. C27—2" 29¢,
No. C28—3" 39¢,
No. C34—4" 69¢,
No. C35—5" 79¢.

No. C28—3"

Magnetic Brad Driver to drive in brads 1" and smaller 16 to 18 gage. No. C22 $2.69 each.
Strip-Zum,a new tool to shave off painted and unpainted wallpaper. No. C31 $3.29 each.

No. C22

Popular best quality Hyde fix-up paint-up tools are sold in leading hardware, paint, building supply and lumberyard stores. Tools not available will be sent postpaid upon receipt of check or money order.
WRITE FOR FREE CATALOG

HYDE TOOLS
SOUTHBRIDGE, MASS., U.S.A.

No. C31

Building PM's Patio-Garage

(Continued from page 153)

ment compliments many styles of homes and provided an ideal match for my own, but the garage framing could be covered equally well with bevel siding, shiplap clapboard or sheathing and shakes.

Following the three framing plans, you start by bolting each wall's mud sill to the foundation. Also, cut 1⅝x12-in. notches in the 4x10s that form the beams for the patio roof extension, though these won't be installed until the eave walls are up.

Begin actual assembly with the "triple corner studs" for all three walls. Note that the eave walls require triple studs on the patio ends only, since their opposite ends tie into the triple stud of the gable wall.

Frame the gable wall first. When the framing's done, rest the sole plate on the mud sill before nailing on the projecting siding. Though two of us would have been able to "walk" the wall upright, calling in another neighbor simplified the task, since he was able to keep the wall from falling while we planted the 2x4 "draggers"—those braces attached to the sides with a single nail so they'll follow the wall up—and muscled the wall into alignment with the mud sill. This aligning is easy: When the siding is snug against the foundation, it's safe to anchor the sole plate to the mud sill with 16d nails.

Note that in all three wall plans there's a double row of horizontal blocking equally spaced between sole plate and top plate. With a plywood "skin" or horizontal siding, you'd need only one row, but vertical boards call for more support, so I nailed each board at top, bottom and twice in between, along both edges. I used 8d box nails, since the heads would be covered when the battens were applied with 16d galvanized nails.

In applying tie plates of the eave walls, note that 3⅝-in. gaps are left in three places for tie plates of the patio wall (plans for which will appear in the final part, July issue). Once the roof boards are applied, you won't be able to nail these crossties in place, so it's a good idea to insert 3-ft. lengths of 2x4 now, nailing so they project inward from the eave walls. Later, you'll tie them into the patio-wall framing.

As the walls go up, they must be plumbed with a level and plumb-bob, secured in this position with braces nailed between the frame and nearby structures, trees or ground stakes. Also tie them to each other with temporary braces until we can roof them over, next month. They form quite a pocket for a heavy wind. ★★★

(Continued next month)

Rugged individual

Nothing works like, looks like, lasts like the Gravely.

Talk about tough, and you talk about the Gravely. It's a tough customer, does tough jobs fast. With its 31 hard-working attachments, the Gravely Tractor has power you can feel and appreciate. It's a standout, with front-running attachments for greater maneuverability, safety and performance. It mows like it loves it, digs gardens like a man after buried treasure, and scoops or blows snow like an eager Eskimo. Gravelys are so rugged they'll still be going strong after the kids grow up. Want a trial run? Want to take a look? See your local dealer. Send for our free catalog. It's fun. So is the Gravely. **Use our budget plan to buy your Gravely.**

GRAVELY

TRACTOR DIVISION Studebaker CORPORATION

5705 GRAVELY LANE
DUNBAR,
WEST VIRGINIA 25064

Roadside Chuck Wagon

(Continued from page 137)

The two-wheel chassis is a steel ready-made half-tonner, bought from Sears' catalog for under $90, complete with tires. The 6-ft. bed is cut from a single 4x8 panel of ¾-in. plywood. Trim 2 ft. off its length and 2 in. off its width to make the center panel, then edge-join two 6x28-in. wings to this to form a blunt T with a crosspiece 58 in. wide. Bolt this bed to the chassis securely, using large washers between the top face of the plywood and the nuts.

All vertical panels—plus the roof—are ¼-in. plywood; the deck is ½-in. ply. Use good-grade exterior type throughout. The framing is mostly white pine 1x1s, which actually measure ¾ in. square. *All* dimensions on the plan are actual sizes.

Assemble all parts with waterproof glue and flathead screws, countersinking the heads. Plug all screw holes and cracks with a good spackling paste. When attaching the fenders, be sure there's a minimum 2 in. clearance above the tires.

To protect all outside corners, I capped them with trunk-type metal corners. For a finish, I used marine primer and enamel on the exposed surfaces, but applied aluminum paint to the chassis, under carriage and kitchen pit. A tough outdoor varnish is all that's needed on the inside of the other compartments.

My wiring diagram is shown on page 137 as a suggestion. The two lower taillights, the amber clearance lights (toward the car), and the license plate light are burning whenever the car's headlights are on. The upper taillights come on only when the brake pedal or turn-signal is operated. I used '56 Impala style lights. The heavy black line is the ground wire to all lights and to a utility outlet mounted in the stove pit. The green wire is a direct line to that outlet from the 6- or 12-volt auto battery. The light line to the clearance lights can be hooked into the car's taillight, but I made them independent of the car lights for use in city traffic or rain.

All the wires are brought together in one place, to an 8-pole strip of binding posts. From here, two 4-wire cables run through the trailer tongue, emerging near the hitch, where they connect to two 4-prong connectors mounted on the bumper.

My chuck wagon's been thoroughly road-tested, at speeds up to 70 mph. It tracks obediently, hugging the road without sway. But you can tell it's rarin' to follow us into the wide open spaces this summer. Maybe we'll see you there. ★★★

LISTEN

to the sound of a Larson hull running

HEAR the air cushion effect of Paul Larson's "Million Bubble Ride" working when you run in a chop. The hull makes a "schuss-schuss" sound as waves are flattened . . . Millions of bubbles are trapped under the lapline hull . . . they compress and roll back from bow to stern.

FEEL the smoothness, speed and stability of this unique boat hull, the product of 51 years of experience.

LOOK at Larson's reasonable price tag for a fibreglass 16' All American with complementary color convertible top set and 18 gal. gas tank and dash gauge—**$1145** (without engine—FOB plant)

Larson

LARSON BOAT WORKS, INC.
LITTLE FALLS, MINN./NASHVILLE, GA.

"We go out of our way to welcome you when you're looking for your first used car.

We're Chevy dealers."

You wouldn't be surprised to hear this at your Chevrolet dealer's.

At a Chevy dealer's, you get the treatment he hopes brings you back *next* time you're looking for a used car. Or even a new car.

He'll also welcome you with many different late-model trade-ins. As well as experienced used car salesmen who actually *wait* on you, once you've looked the cars over.

And because Chevrolet dealers go out of their way for you, you don't have to go out of *your* way for them. You'll find at least one—complete with after-the-sale service facilities—right in your neighborhood. . . . Chevrolet Division of General Motors Corporation, Detroit, Michigan.

SEE YOUR CHEVROLET DEALER FOR THE USED CAR OR TRUCK YOU WANT

PHOTOGRAPHED AT FLORIDA'S SILVER SPRINGS

What has the tilt-up advantages of an outboard yet swings a prop as big as an inboard?

MerCruiser Stern Drive. MerCruisers, like an outboard, can run right up on the beach without damage to drive unit or propeller. MerCruiser's drive unit tilts up, to clear the bottom of the boat . . . no fixed, angled shafts, struts, or rudders on the bottom. This makes MerCruiser easier to launch, easy to trail and lets you run safely in shallow water.

MerCruiser's drive unit tilts up on impact to slide over submerged objects. Hydraulic shock absorbers cushion the blow. The drive unit can be adjusted to different tilt angles like an outboard.

MerCruisers not only have the advantages of an outboard, but they swing a big, slow-turning propeller like an inboard. With gear ratios up to 2:1 you get tremendous low-speed thrust without sacrificing high-speed performance. MerCruiser's exclusive Jet-Prop exhaust buries noise and fumes far behind the boat, underwater drag is reduced, and engine breathing is improved. And, there are no shear pins to fail.

Ask your MerCruiser dealer to show you all the reasons why more people buy MerCruiser than all other stern drives combined . . . 60, 110, 120, 150, 190, 225 and 310 hp gasoline; 60 hp diesel.

Worldwide Sales and Service

MERCRUISER

STERN DRIVE POWER PACKAGES

©1965, Kiekhaefer Corporation, Fond du Lac, Wisconsin, and Toronto. Subsidiary of Brunswick Corporation.

Coolers for Campers

(Continued from page 127)

interior. Depending on capacity and make, the price of this type can range from $20 to $40.

While these expensive models offer extra features such as drains, storage trays, built-in bottle openers and chrome-plated carrying handles, their main feature is durability.

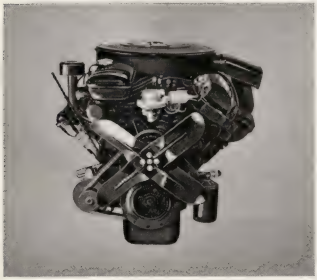
For this durability test we used a steel Coleman, a steel Thermos and an aluminum-cased Ted Williams cooler. We dropped them empty and loaded without damage, and then kicked them down 18 steel-edged concrete steps. All three were dented by the steps, but not badly. The latch flew off the Ted Williams chest, but it was easily put back on and it worked perfectly. There was no damage to hinges on the three coolers.

Dropped from a height of eight feet onto a pointed steel edge, all of the metal chests were dented, but none had the skins penetrated. The back of the Sears chest was pushed in a half inch beyond the edge of the lid, but it was easily straightened by hand. The impact was severe enough to split the plastic food trays inside the Sears and Coleman chests.

Late in June, 1964, I went into Death Valley with a Coleman Snow-Lite and a plain Penguin polystyrene cooler that I purchased in a hardware store for $3.50. At Furnace Creek, where the thermometer registered 130 degrees in the shade, I put 25 pounds of ice in each cooler. We drove all day in tremendous heat. Except for the canvas top, the Land Rover was open. That night, after climbing out of the Mojave Desert, we stopped and checked the ice in both chests. There was a piece about the size of a coconut in each cooler and the piece in the polystyrene box was slightly larger.

As a general rule I found that a 25-pound piece of ice would last about three days in either cooler.

In our office tests we placed a 25-pound chunk of ice and a quart of milk in four different coolers: the Weberlite "30" with metal sides, a plain polystyrene Carrylite, the Sears plastic model and the steel Coleman. We closed and sealed the boxes on a Friday at 3:30 p.m. When they were opened at noon the next Monday, only the inexpensive Carrylite still contained ice, a piece the size of an apple. But the water in each one was still ice cold, and on Wednesday at noon the milk was tasted and found to be fresh.—*Stuart James*



Get peak performance from your car engine . . . —give it this "2-minute tune-up in a 15-ounce can"

This is tune-up time . . . time to ask your service man for Quaker State SDA. This super detergent additive in your crankcase oil peps up tired engines, restores full power. SDA dissolves away power-robbing varnish and sludge deposits, frees up sticking valves, and prevents rust and corrosion. The result—better engine performance, less engine wear, and easier cold-weather starts for longer battery life. Have a cleaner, better-performing engine. Ask your Quaker State dealer for SDA . . . the 2-minute tune-up in a 15-ounce can!

QUAKER STATE OIL REFINING CORP.
Oil City, Pennsylvania

SDA is made by the makers of

170 cubic feet of station wagon.

This picture may look a little odd.

But so are most conventional station wagons when you consider how little they hold.

The two above average about 85 cubic feet each. The Volkswagen holds twice that: 170.

And even if you did put two conventional wagons together you still couldn't carry the kind of things you can in a VW.

The Volkswagen has a 14-square-foot hole in the roof for sticking tall things out of.

And five big doors to stick things into.

On the inside, the VW has seats for 9 people

© VOLKSWAGEN OF AMERICA, INC.

170 cubic feet of station wagon.

and room for 28 cubic feet of luggage.

But on the outside, it's only a scant 9 inches longer than the VW Sedan.

You can park it like a little sports car.

And everywhere you go, the Volkswagen engine is right behind you.

It goes over 20 miles on a gallon of regular gas. And you never have to pay for antifreeze, flushings, or radiator repair.

There isn't any radiator.

When you think about it, the VW Station Wagon not only holds a pile, it can also save you one.

Iceberg Patrol

(Continued from page 103)

size and precise location, latitudinally and longitudinally. If this is done, each can be identified again on the next flight, its drift can be charted, and a record kept on how much it has melted or eroded.

During these hours-long preliminaries some 400 bergs were charted. Commander Lenczyk took a few breaks to explain to me what icebergs are and how they behave.

"Tens of thousands break off from the Greenland glaciers," he said, spreading out a map of Baffin Bay, "but only ten percent may reach Baffin Island. Only ten percent of those reach the 48th parallel near Newfoundland. The others erode from too many summers, too much buffeting in the ice packs of Baffin Bay, or they melt once they leave the protection of the ice packs."

But, by sheer force of numbers, he said, enough will survive to drift south of the 48th and become a hazard in the shipping lanes. Their numbers vary from year to year. In 1957, more than 1200 were sighted; in 1958, only one. Last year, they spotted 400, about average.

Lenczyk described their types and the significance of each. "*Tabulars*, sometimes called *tabletops*, are long and flat and usually rare in this area. Since they do not have much superstructure, they don't sail with the wind but follow the current and seldom run aground.

"*Drydocks* have two peaks with an area resembling a cove in between, and *pinnacles* have one peak. Both are good sailors, traveling well with prevailing winds —drifting up to 20 miles a day in a 30-knot breeze—but both erode faster than others because they ride higher and have more exposed surface.

"*Domes* are more rounded with an average speed and life span.

"Lastly, there are *growlers*, which are too small to be called icebergs. Most are pieces that have broken from, or are the remains of, icebergs. Too small to ride erect—most are smaller than an average-size house—they roll and hiss in the waves. Yet they can't be ignored, because they are dangerous themselves and usually warn of larger ice upwind."

Bombs, Explosives Useless

And, as any school child knows, it's the part that does not appear above the surface that counts. Icebergs, generally, are seven times as large underwater as they are above. Some northern tabulars are as long as 750 feet or as large as a good-size city block. The largest northern hemisphere iceberg ever officially sighted was estimated at 1500 feet long and 550 feet high—or as long as five football fields and about forty stories high. Antarctic bergs bigger than Long Island have been recorded. Multiply *that* by seven and set it on your mantelpiece.

Such mammoth proportions are hard to visualize, but the Coast Guard at one time actually tried to find ways to destroy icebergs before they ever got to the shipping lanes. Their efforts were about as hilarious—and met with as much success —as the Navy's attempt to get rid of the gooney birds on Midway Islands (page 102, Sept. '62, *PM*).

They tried bombing the bergs out of the water. About all the bombs did was put a few pockmarks in the ice above the water. Virtually nothing happened to all the ice below the water. And, considering the number of bergs floating around, the Coast Guard decided this method was . . . well, impractical.

They tried Thermite explosives. When Thermite burns it produces temperatures up to 4000° F. All it produced on icebergs was a pretty explosive pattern. End of Thermite experiment.

Paint Bucket Attack!

Then they painted the bergs with carbon black. The theory was that the carbon had the capacity to hold heat from the sun's rays, which would penetrate the bergs and hasten thaw. Picture lonely little groups of Coast Guard seamen, climbing across icebergs all over the ocean, little buckets in their hands, painting icebergs black. It didn't pan out, somehow.

One other wacko suggestion was that planes fly over and drop plastic "greenhouses" over the icebergs, thus absorbing the sunlight and melting the ice. By this time, the Coast Guard had had it, and went back to tracking the bergs.

If you can't beat 'em, go along with 'em.

Preflight calculations reveal whether current, wind, temperature, or a combination will have the most effect on each berg. If temperatures are above 40 degrees, for instance, a small iceberg may last five days; larger bergs, last 12 to 20 days.

Current, too, is predictable. One, the Labrador Current, hugs the Canadian coast and takes a lot of bergs with it past the tip of Cape Race. The current forks here and takes more bergs past the continental shelf to the southern tip, or Tail of the Grand Banks. Beyond here, the sea floor drops from 100 to 1000 fathoms. Few bergs drift beyond this point.

The two key spots, then, comprise an area 100 miles south of Cape Race and the Tail of the Grand Banks. Both are watched

(Please turn to page 208)

Here's one of eleven Western Wood Vacation Home designs!

They're all yours for a dime!

All eleven Western Wood designs are in our new "Vacation-Land Homes" booklet. You can buy a copy from your lumber dealer now, for a dime. It's really a bargain. There's a complete description, architectural rendering and floor plan of each vacation home. And there's a list of all the materials necessary to build any one of the eleven designs. After you pick the design best for your site and family, we'll provide you with detailed construction plans for just $5.00. For each of these novel second home hideaways, the architects have specified Western Woods. For good reason, too. Western Woods not only fit the rustic mood of the great outdoors, they're easy to work, easy to saw, easy to nail, and they take any kind of paint or stain.

If your dealer doesn't have our "Vacation-Land Homes" booklet, send us 10c and this coupon. We'll mail one to you.

Plese send me your book on Western Wood Vacation-Land Homes. Enclosed is 10c.

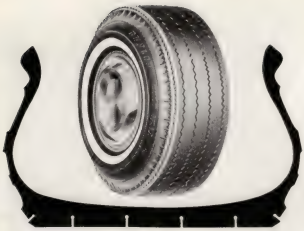
Name _____

Address _____

City _____ State ____ Zip ____

WESTERN WOOD PRODUCTS ASSOCIATION

Dept. PM-565, Yeon Building, Portland, Oregon 97204



Certified safe at 100 mph*

A First . . . the new popularly priced Dunlop Gold Seal Low Profile tire has been tested and proved safe at sustained speeds of 100 mph, to make certain you have a wide margin of safety even at today's freeway limits.

You also get new mileage and traction advantages in the Gold Seal:

LOW PROFILE The new Gold Seal is designed low to complement today's road-hugging automotive styles.

LONG MILEAGE A wider footprint area spreads out the load for longer wear. Tyrex or nylon full four-ply construction for greater strength.

TRACTION-WIDE PRINT There's more surface contact with the Gold Seal, and tread sipes are more plentiful for phenomenal traction, especially on wet pavements. You also get patented Dunlop Safety-Shoulders to carry you up, down, and diagonally over obstructions without a lurch.

NEW INNERLINER Our new pressure-seal innerliner holds air four to five times longer than ordinary tires.

Ask your local Dunlop dealer to show you all the benefits we've engineered and built into the low profile of this new Gold Seal. From 100 mph safety to innerliner, it's the real tire for a change.

* "We certify that Gold Seal Low Profile tires were in excellent condition after numerous tests at sustained speeds of 100 mph."
Tire Engineering Service Testing, Inc., Carson City, Nev.

DUNLOP
TIRE AND RUBBER CORPORATION, BUFFALO, N. Y. 14240

Iceberg Patrol

(Continued from page 206)

carefully. Our flight path was to take us beyond the southernmost known berg, swing east past the Tail, then start flying a grid pattern over the ice pack, each leg 25 miles apart. This would give observers an area to cover of about 12½ miles on each side of the airplane on each leg.

Maps marked, the crew and observers gathered their equipment. We all donned life preservers and headed for the flight line. It was dark and cold, but we could see the overcast. When our wheels left the ground, we knew we wouldn't see the sun that day—and we'd be gone 8½ hours.

Ensign Neely took his station in a seat behind the pilot, map board in his lap. Ensign Goras, headset on, patroled the cargo compartment. The standard starboard and port cargo doors had been replaced by heavy glass doors. With binoculars, he could see long distances on either side. Neely, looking straight ahead over the pilot's shoulder, could tell him over the intercom where a berg was upcoming.

Fly Low and Slow

When we leveled off, I got my first of two surprises. We were only at 1000 feet, an altitude we would maintain for the entire trip. If the overcast were lower, we would fly at 500 feet, depending on electronic instruments for sightings.

The second surprise came moments later. The pilots cut both outboard engines and feathered the props. We cruised the rest of the flight on the two inboard engines. It not only conserves fuel, but slows the plane so it won't go by bergs too fast.

Growlers usually comprise the first and most common sightings, because there are so many of them. Even these are awesome. As we passed the first one, we could see it churning, rolling and bobbing in slow, heavy motions, allowing the sea to run over it, then throwing it off. It was a pale circle of bubbling green compared to the dark, dirty color of surrounding sea. As it churned it created a ring of foam, like a bobbing Pacific isle with a white coral reef. Then it was behind us. But even this small piece of an iceberg shook me. I felt insignificantly puny. It could roll over and crush a boat as easily as a man might squash a bug.

Neely marked each sighting on his map, using special symbols: a small square for a growler, a triangle for a berg, with identifying symbols behind it—S, M and L for small, medium or large; T, DK, D or P for tabular, drydock, dome or pinnacle, and a V for varying sizes. When we came

(Please turn to page 210)

spring free on a new M-50

Owning title to a Harley-Davidson M-50 is like having your own "Declaration of Independence." You go where you want, when you want. No need to depend on the "family wheels." No need to miss out on all the fun.

What's more, you'll like the way an M-50 takes to the road. How it cruises at a comfortable 40 mph. And puts nearly 300 miles between filling stations. In addition, low-cost insurance is readily available. Stop in soon, check out an M-50 at your nearby Harley-Davidson dealer. Run it through its paces. Take a friend along. Discover exciting new worlds of adventure — together.

only $225

plus low delivery charge

HARLEY-DAVIDSON

Iceberg Patrol

(Continued from page 208)

to an area of several bergs, he would count them and jot the number down before the symbol. A typical sighting might read 7△VDK, for seven drydocks of varying sizes.

Back in the cargo compartment, Goras was using binoculars to identify far-away bergs. Occasionally, he would take Polaroid pictures, marking the backs of the prints with the coordinates. On an overcast day the prints could give no more than a visual record of a sighted berg; on sunny days they could give more.

Goras explained, "At this altitude, the camera is set on infinity, so anything that appears on the water will have the same size relationship, including the shadow of the airplane. We try to shoot a berg with the shadow in the picture. Since we know the size of the plane's wing, and our altitude, we can calculate the size of the berg from the size of the wing's shadow on the water."

Most days on the ice patrol are far from sunny. April and May around Newfoundland are 90 percent overcast and rainy—sometimes right down to the deck.

So they fly some days when eyeball inspections are impossible. On these days, from about 500 feet with two props feathered, radar is used. But it is not dependable. A surface vessel will reflect the beams eight times better than an iceberg.

A special-purpose radar, a microwave radiometer, is also used. It distinguishes between boats and ice, but does not tell the observer what type of ice.

An airborne infrared radiation thermometer is now being tested. It measures surface temperatures, indicating currents, and theoretically should be able to distinguish, by the temperature spread, an iceberg from the surrounding water. However, mounting troubles have slowed this experiment.

Finally, they are also trying thermal photography, taking pictures through the fog whenever they have an iceberg spotted. But, a fast-moving plane has hindered any significant contribution to date.

What Lenczyk and the others hope for is more sophisticated radar, so they could ignore the weather and fly in anything with the efficiency of 'eyeball' flight.

On our flight, we saw each berg and they are something to behold. It's hard to imagine how anything so majestic can be so dangerous. Man, so far, can only find and follow them, and warn others to stay out of their way. That is the work of the International Ice Patrol. ★★★

Proven way to succeed

...in a business of your own!

Thousands of independent businessmen have found security, prosperity and satisfaction by owning and operating their own Western Auto stores.

It's a road to success which has been used by thousands of Western Auto dealers. Western Auto will guide you and provide you help . . . in a way that has already worked for others like yourself. You reap all the advantages of dealing with one of the largest retailers in the country — benefitting from their volume buying and marketing know-how. Yet you're your own boss. Minimum investment of $15,000 required.

MAIL TODAY FOR FREE BOOKLET that explains the Western Auto plan for independent success. No obligation.

Charles Wilson, Jr., Treasurer
WESTERN AUTO SUPPLY CO., Room 500
2107 Grand Avenue, Kansas City, Mo. 64108

Please send my free copy of "DOORWAY TO OPPORTUNITY" to:

NAME

ADDRESS

CITY STATE ZIP

I am interested in locating in

(CITY OR STATE)

PLUMB
FA57
HAMMER

with
NON-BREAKABLE
Fiber-Glass Handle
STRONGER THAN STEEL
GUARANTEED
Not to Break, Bend or Collapse
In Normal Use

Regular Price $5.75
Hardware Week
***SPECIAL* $4.75**
SAVE
$1.00

and **MOLDED DURA-CUSHION GRIP**
Non-Slip • Absorbs Shock
reduces fatigue
Patented **PERMABOND®**
A Plumb Exclusive — Keeps Handle Tight
Also available in Ripping Pattern FA57R

BUY THE BEST . . . BUY
PLUMB®
Fayette R. Plumb, Inc. — Phila., Pa. 19137

Owner's Report—Corvair

(Continued from page 93)

"I get cheaper license plates."—New York teacher.

Every couple of bucks helps.

There are more unhappy owners to be heard from, this group talking about problems from noisy rattles to an inadequate heater. Here are examples from their reports:

"I've taken it back five times to see what could be done about the rattles. Finally got the results I wanted by doing it myself."—Oklahoma secretary.

She may have a secondary career going. Good mechanics are hard to find.

"The curved door glass has no edging. Several people have walked into glass and some were hurt."—Connecticut banker.

"Curved window glass is attractive, but allows occupant to be drenched when opening the window in rain or snow."—Virginia computer marketing man.

Here's a styling 'improvement' that owners are resisting, at least until development is perfected.

"I decided to buy a Corvair because of economy—which I'm not getting."—California mailman.

"Dual carburetors are hard to keep in adjustment."—California registered nurse.

"Heater must be used to demist; a pain in the neck on a warm, rainy day."—Florida association executive.

It's a little more complicated with an air-cooled engine since you can't open air passages, yet leave the water supply closed.

"Defroster doesn't do a good job on ice. Problem is the location of the ducts."—New Jersey chemical engineer.

But there's more to praise, too. Owners also like the interior room, upholstery, cornering ability, the instrument panel, and the folding rear seat:

"I like the comfort and legroom. I'm six feet one."—Florida production control man.

"It's as roomy a car as you can find on the market."—Tennessee farmer.

Oh? Because the Rolls back seat is so cluttered with the bar, desk, phones and the like?

"The upholstery is easy to clean."—Ohio housewife.

"Vinyl design and quality looks as good as on cars I've owned that cost much more."—Illinois police officer.

"It's unbelievably agile on mountain roads."—Washington fire control agent.

"With this individual wheel suspension, you can adjust camber on the rear wheels as easily as on the front. There's little lean on curves and quick steering."—Georgia naval airman.

And the camber change throughout wheel travel is nearly halved with 1965's parallel arms.

"It hugs the road on corners, is easy to control in light skids."—Massachusetts teacher.

"I like the recessed instruments. I can't stand to have people watch the speedometer."—Pennsylvania teacher.

Particularly maiden aunts.

"I like the fold-down back seat and rich-looking appearance. It's easy for a salesman to carry samples and small children can easily play back there on long trips."—Illinois salesman.

Here are the representative owners' statements demonstrating the final group of complaints:

"The motor should idle more smoothly and quietly."—New York salesman.

Our test car's engine sounded frantically busy, but a three-speed transmission would avoid lots of engine-racing noise.

"The engine noise should be dampened by more sound-deadening material."—California banker.

"The dashboard is too high, giving you a feeling of sitting in a hole."—Ohio engineer.

Others might call that a 'continental feel'; it's common enough in many imports.

"The dash looks cheap and the instruments aren't reliable."—California engineer.

"Padded dash, ha! Where's the padding?"—Minnesota ad agency analyst.

It may not seem like much, but rubbery resilience isn't what's needed. Other materials soak up impact better without flinging you back.

"With four in the car, the shocks are very poor. Each little bump is felt violently."—Ohio oil worker.

"The front springs seem to be weaker than before. They will bottom occasionally, whereas the '60 model would not."—Illinois machine operator.

Although the car's heavier now, the wheel rates are softer. They have gone from 86 to 71 in front, 192 to 149 in rear since 1960.

"The car seems to want to wander."—Colorado accountant.

"I have two cement blocks in front, which helps a little."—New York teacher.

Mr. Accountant, say 'Hello' to the nice teacher.

And that's the report from owners after racking up nearly a million miles in their new Corvairs. ★★★

Cussing won't prevent stalling.

But a Stewart-Warner electric fuel pump will.

A S-W "240" Fuel Pump is a high-performance engine's best insurance against stalling due to vapor lock. Assures quick starts whatever the weather. Exclusive adjustable, automatic pressure-regulator keeps fuel flowing smoothly. Prevents starving and flooding. Line pressure adjustable up to 8 P.S.I.—delivers up to 60 G.P.H. For 6 or 12 volt systems. Your Stewart-Warner dealer will show you a S-W Electric Fuel Pump. You can count on it...from the makers of the most complete line of automotive instruments in America.

STEWART-WARNER Symbol of SW Excellence

INSTRUMENT DIVISION

Dept. C-55, 1840 Diversey Parkway, Chicago, Illinois 60614

Good deal NEW 6 HP SIMPLICITY SUPER WONDER-BOY offers features you'd expect to find only in larger, more expensive machines — all-gear transmission and combination brake-clutch . . . wide Floating Traction tires for superior traction, minimum ground pressure . . . foam cushion seat and convenient controls for riding comfort and handling ease. Famous Simplicity "no scalp" mowing. Other Simplicity riders: **4 hp Wonder-Boy; 6 hp Broadmoor Tractor; 9 hp Landlord Tractor.** Make yours the Simplicity life this season!

Good dealer Your nearby Simplicity dealer not only handles America's No. 1 line of power lawn and garden equipment, he's actually part of the product he sells! If you've ever been burned by "no-service" retailers or "no name" machines built to price alone, you'll doubly appreciate the Simplicity "good dealer" — proud to stand behind his product, anxious to see that you get all the performance built into it! Ask him to recommend the right unit for your needs. Low down payment and budget terms available.

DO IT WITH *Simplicity*

Simplicity Manufacturing Company
6542 Spring Street • Port Washington, Wisconsin

Put an oil refinery in your car!

Detroit tells us their late-model cars need less-frequent oil changes. Which means the filter really has to do a job.

A Lee Oil Filter does **two** jobs. It removes dirt and neutralizes engine-destroying acids which often form as a by-product of combustion. It's like having an oil refinery in your engine.

This dual-action purifying process, made possible by LEE's **Resinweld** construction and unique antacid **Feridium** anode, assures better performance, longer life. ***FREE:***

"Weekend mechanics guide," interesting, helpful booklet on car care. Send for your copy now.

LEE OIL, AIR & FUEL FILTERS
Available wherever you go for your car needs.
Lee Filter Corp., Dept. P 3, Edison, New Jersey

Fabulous Pivot-Wing Plane

(Continued from page 87)

tion, and talked to some of the people involved, including one of the test pilots. The general atmosphere is one of enthusiasm, and no one seems to have lingering ulcers from the years-long competition.

In fact, J. T. (Bing) Cosby, GD's F-111 program director—a jovial, non-ulcer type if there ever was one—said flatly, "We never had any doubt that we'd win."

Yoke Is the Key

Any story of the F-111 has to begin and end, not with the wings, but with the yoke that binds them to the fuselage. It is to the F-111 what a backbone is to a vertebrate. Once in the air, the whole airplane is supported by it.

Even the material is unique—B6AC tooling steel, an infinitely hard alloy never before used on aircraft. The yoke, which is 14 feet long, rests on top of the fuselage near the widest point in the wing fairing. At each end are two giant pins, 8½ inches in diameter. The wings pivot on these pins.

Forward of the yoke is the actuating mechanism, a long cylinder with two arms. The arms inside these cylinders are huge screws like those on hydraulic dump trucks. The outside ends of these arms are attached to smaller pivot points on the leading edges of the wings. So, as the huge arms screw out from the cylinder, the wings are forced back to the swept-wing position. As the huge screws retract into the cylinder, the wings are pulled forward.

The yoke, however, while not entirely new, is the key to the breakthrough. As Cosby explains it, "The old Bell X-5 and the Grumman F-10F had variable-sweep wings. But in each case they pivoted on one pin. When the wings swept back, the center of gravity shifted, so the whole mechanism had to move back simultaneously. It was cumbersome. We eliminated the problem with two pivots."

Flying Fuel Tank

GD eliminated a few other problems, too, including fuel tanks. The entire airplane, except for the cockpit and engines is a flying fuel tank. All empty space is used, including the wings—even when they're sweeping back and forth. Joints and rivet holes are sealed up. When fuel is poured aboard, it finds its own way into every available crevice.

Getting it out is easy. In the wings, for instance, five pounds of pressure is maintained. Two fuel pumps at the wing tips force the liquid into the fuselage. From there it is forced to the engines. Flexible

(Please turn to page 216)

This toughie has a heart of steel.

(AND A SOLE OF OIL-RESISTING NEOPRENE.)

There's a steel shank at the heart of this hardy little worker. And it supports your feet as they should be supported if you're on your feet a lot. That sole? It's oil-resisting cork Neoprene. Want more? There's a famous Chro-Tan insole that prevents the discomforts of dried out, curled or cracked insoles. There's a Polyethylene Perma-counter for added comfort. Prices for Ranger shoes start at $8.95.

RANGER
A QUALITY PRODUCT OF ENDICOTT JOHNSON.

SEE RANGERS AT THE STORE NEAREST YOU OR WRITE: ENDICOTT JOHNSON, ENDICOTT, N. Y.

RADICALLY NEW WAY TO STOP RUST FOREVER!

get KURUST

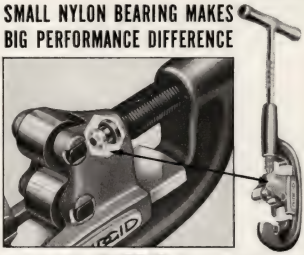
- **Works by revolutionary new process**
- **Turns rust into rust-proof coat**
- **No rust remains under coating**
- **Takes any paint; oil, metallic, cellulose**

Just brush away loose, powdery rust from metal surface—then paint with KURUST. Protects against all corrosive conditions—humidity, salt water, fumes, exposure. Combines chemically with the rust itself to form a rust-proof metallic coat. No layer of active rust remains under the coated surface (as happens with leading sprays and other so-called rust-proofers). Even if the KURUST coat is scratched, rust will not spread under it. The coating is in direct contact with the metal, bonding firmly and smoothly to insulate against corrosion. Use on any rusty, iron or steel surface. Results guaranteed.

Available at paint, hardware and auto supply stores.

For free folder, write: Halo Sales Corp., 444 Townsend Street, San Francisco, Calif., or Kurust Distributors, Ltd., 1919 W. 53rd Ave., Vancouver, B.C. Inquiries from distributors and dealers invited to San Francisco address.

SMALL NYLON BEARING MAKES BIG PERFORMANCE DIFFERENCE



That's why RIGID Pipe Cutters are easiest to use . . . cut the straightest!

Cuts all ⅛" through 2" pipe and conduit

Start feeding a RIGID Cutter into a pipe and you'll feel a remarkable difference. Its smooth, cushioned action makes cutting easier, faster and more accurate. Why? Because the feed screw turns freely on a nylon bearing. This same bearing also absorbs shocks, resulting from uneven pipe surfaces, to let the cutter wheel track smoothly. This means less work for you. . . and straight, even cuts every time.

You can get this Cutter and other RIGID Work-Saver Tools at your Dealers.

RIGID®

THE RIDGE TOOL COMPANY, ELYRIA, OHIO, U.S.A.

When motorists can't see any sign of poor performance as their cars get older, maybe it's because they saw this sign when their cars were new.

KENDALL
MOTOR OILS

Kendall refines quality motor oils from the world's richest 100% Pennsylvania Crude Oil. Your dealer will recommend the one best suited to your engine, your driving habits and your pocketbook. When you start using Kendall Motor Oil, you get the extra margin of safety and the Economy of Kendall Quality.

RACING ENTHUSIASTS
We've printed eight vignettes of famous races run since 1903 in a little brochure titled "A Short History of Racing." You'll find it interesting and informative.
Write for your free copy.

KENDALL REFINING COMPANY
Bradford, Penna. / Toronto, Canada

Fabulous Pivot-Wing Plane

(Continued from page 214)

hosing at the wing roots, with pivots of their own, keep the fuel flowing.

The slats on the leading edge of the wings are full span, and the full-span flaps are double-slotted. Slats and flaps are not new, but on the F-111 they've just about reached their ultimate. In test flights, the prototype has been averaging less than 3000 feet on takeoff rolls. This compares to 10,000 feet or more required by current operational fighters.

Another unusual feature of the wings is that they have no ailerons for roll control. Spoilers on the upper surfaces raise to reduce lift. Depending on which side is activated, the spoilers will drop one wing or the other.

Tail Section Moves Up and Down

The tail assembly is unusual on several counts. It has a normal vertical stabilizer and rudder, but no horizontal stabilizer. The entire horizontal tail section moves up or down to control pitch, but the two sides also work independently to control roll. So they're both elevators and ailerons or elevons. General Dynamics calls them "differential horizontal stabilizers."

Here's how they work: The spoilers in the wings are effective at slow speeds until the wing is swept back past 45 degrees. Then they cut out. The differential stabilizers now take over both roles. When the wings are swept all the way back (72½ degrees), the plane is, in effect, a delta-wing and the stabilizers operate the same as a delta wing's elevons.

The fuselage is one long tube of sophisticated equipment and innovations, the two most important of which are the cockpit and the twin engines.

The cockpit, or "module" as they now call it, is a self-contained capsule that could easily be identified with the *Mercury* and *Gemini* space capsules. All three are made by McDonnell Aircraft Co. The module holds the two pilots side by side, plus all the usual controls and the one unusual control for the wings—a pistol grip that operates like a slide trombone. It moves forward to sweep the wings back, and backward to sweep the wings forward. More important, the entire capsule can be blasted free of the plane in emergencies. An exploding wire separates it from the fuselage, and a rocket blasts it free.

The pilots, who wear no parachutes, ride the enclosed cockpit down just like a space capsule. Part of the upper fuselage, shaped like a flat paddle tail, rides down with it to give it stability, and a huge parachute

(Please turn to page 218)

STILL THE DEADLIEST

South Bend BASS-ORENO®

Popular Mechanics chose the BASS-ORENO® as one of the all-time Deadly Dozen lures . . . and for over 60 years, it's been just that. When everything else in the tackle box is wearing out the arm, this one gets the job done. No plastic, either. Just perfectly balanced, select cedar in 20 proven finishes, and four sizes from 1/4 to 5/8 ounces.

South Bend
TACKLE CO., INC.
1108 S. HIGH ST.
South Bend, Ind.
46623

SEND TODAY FOR NEW SOUTH BEND FISH AND TACKLE REVIEW. TIPS FROM EXPERTS ON KNOT TYING, CASTING, WORKING LURES, WATERWAYS, HOT SPOTS AND MUCH MORE. SEND 50c TO DEPT. R-1305

GRINDS **POLISHES**
DRILLS **SHARPENS**
CARVES **DEBURRS**

No. 2 Moto-Tool Kit Illustrated

MOTO-TOOL THE POCKET SIZE MACHINE SHOP

Handiest tool you'll ever own. Does fine detail work with pin point accuracy. Eliminates time consuming hand work. Gets into places difficult to reach with larger tools. 27,000 RPM. Collet sizes 1/8", 3/32" and 1/16". An industrial favorite since 1936. Wt. 13 oz.

NO. 2 MOTO-TOOL only **$19.95**
NO. 2 MOTO-TOOL KIT with 23 accessories in steel case **$29.95**

NEW HEAVY DUTY NO. 3 MOTO-TOOL

New high torque motor designed for hard industrial use. Same features as No. 2 plus 50% increase in power.
NO. 3 MOTO-TOOL only in steel case **$29.95**
NO. 3 MOTO-TOOL, 23 accessories, steel case . . **$37.95**

SEE YOUR DEALER OR WRITE FOR CATALOG
Dremel Mfg. Co. • Dept. 115-E • Racine, Wis.

Stops Leaks

DAP® BUTYL-FLEX® Butyl Rubber CAULK

Prevents damage from air, water, heat leaks. Seals tight around windows, doors, threshold strips, construction joints. Outlasts conventional caulks 5 to 1. High resistance to salt water, fungi. Stays permanently flexible. Sold at leading hardware, building supply, paint and specialty stores.

DAP® DAP INC., Dayton 31, Ohio
SUBSIDIARY OF Plough, Inc.

Lennox Kittytrack®
World's Finest Crawler-Type Lawn and Garden Tractor

- Gentler to your lawn — positive traction in your garden
- Safer, surer on grades and sidehills
- More maneuverable . . . square corners
- Full line of lawn and garden tractor implements
- Front mounted lawn and snow equipment
- Three point, lift, rear hitch for garden attachments

Write, for free illustrated booklet.
Dept. PM

LENNOX *Industries Inc.*

P. O. Box 3092, East 14th St. Station
DES MOINES 16, IOWA

Fabulous Pivot-Wing Plane

(Continued from page 216)

blossoms out to float it to earth. If it lands on water, the capsule will float; if on land, an air bag cushions its fall. Survival gear in the cockpit will help the crew stay alive until picked up.

Turbofans with Afterburners

The engines, because of the plane's required versatility, created another problem. Like airframes, engines are built for specific missions. But the F-111 had to have power for high and low altitudes, high and low speeds, plus economy at long range. More white blackbirds. Its twin TF-30s, made by Pratt & Whitney, are turbofan engines with afterburners. The fans add efficiency and economy, which standard turbojets don't have at low altitudes, and the afterburners boost power for supersonic speeds.

Early problems with the engines caused some concern, but GD said they would be worked out.

On the underside of the fuselage is the bomb bay, which can carry 100 different types of missiles or rockets. Then there are wheel wells for the tricycle landing gear. The door to the main gear's well swings down and forward and doubles as a speed brake for quick slowdowns.

The F-111 could also be equipped with hard points (pylons) under the wings for additional weaponry, possibly six-barrelled cannons mounted in pods. The pylons would swivel to line up properly for any sweep position of the wings.

5000 Miles, Arms Folded!

The electronic gear is in the nose. One major feature is an inertial-guidance system that will make the F-111 virtually a manned missile. The system, based on gyros, can be set before takeoff and, with information fed through the autopilot, will sense any deviation from course or speed. The pilots, in effect, can fly a 5000-mile mission with their arms folded.

The F-111, unlike the Mach-3 B-70, has not gone in heavily for titanium, a metal that is more heat-resistant at high speeds. It carries about 1200 pounds of it, mostly in fittings and fasteners, and in the panels of the inlet area of the engines. Remaining skin surfaces are conventional aluminum alloys, and are considered sufficient up to Mach 2.5.

The basic differences between the Air Force and Navy versions of the F-111 are that the Navy plane has a shorter nose (because of reduced electronic gear), lighter weight and stronger landing gear

(Please turn to page 220)

BEST LOW COST ELECTRIC WELDER MONEY CAN BUY ONLY $14.95

5-YEAR GUARANTEE
10-DAY MONEY BACK TRIAL. WELDS, BRAZES, SOLDERS, CUTS ANYTHING OF METAL

No comparison for performance and value. No experience needed to make or repair auto bodies, fenders, trailers, boats, furniture, farm equipment, garden tools, anything of metal. Use up to ¼-in. welding rods and ¼-in. carbons on up to ¼-in. metal. Operates on any 110 V. line. **WORLD'S GREATEST WELDING VALUE.** Over 500,000 in use by home owners, farmers, hobbyists, mechanics. **5-Year unconditional guarantee.** Order on 10-day moneyback trial, if not satisfied return for refund. **LITERATURE FREE**

SEND ONLY $2.00

You Get: FULL FACE SHIELD, heavy metal cabinet, ground clamp, 12 ft. of heavy duty welding cables, twin carbon arc torch, rod holder, carbons, welding and brazing rods, flux, solder, instructions. **SEND ONLY $2.00.** Pay $12.95 plus C.O.D. charges on delivery or send only $14.95 and we will ship prepaid. Order today

FOUR-WAY WELDER CO.
DEPT. W2-E, 1810 S. FEDERAL ST., CHICAGO, 60616

Increase Acceleration . . . AND PROVE IT!

Analometer by Auto-Lux
$39.95 PPD.
Introductory Offer
~~$49.95~~ Regular Price

- 1% accuracy of all functions.
- Combines accelerometer, tachometer, point dwell and coil output in one package.
- Indicates any losses in ignition system.
- Adds RPM — reduces e.t. (elapse time).
- Used in competition automobiles and boats.
- All Solid-State construction.
- 6 and 12 volt systems: Direct reading for 4, 6 and 8 cylinder automotive or marine engines.

Guaranteed - Send check or money order (Calif.- add 4% tax) to:
AUTO-LUX DIVISION/J. E. TURNER CO. INC.
18376 Ventura Blvd., Tarzana, California

SEALMASTER
FLAPPER
TANK BALL
QUIET, POSITIVE ACTION . . . SEALS AUTOMATICALLY. READY TO INSTALL

STOPS WATER WASTE

AT HARDWARE STORES

Syrup is for pancakes.
(and tenderfoot pipesmen)

Revelation is for pipe smokers who're tired of sweet, syrupy blends. You get the rich *naturally* mellow flavor of five great tobaccos. It's a taste you can stick with all day long.

Revelation is for the experienced pipe smoker.

The New P-500 JET OUTBOARD Offers Twice the Fun in '65
5 H.P., WEIGHS APPROX. 29 POUNDS
FULL ONE YEAR WARRANTY

12,000 Clinton Stations Service This Engine
Operates in 3" of water • Skims over weeds • Perfect for trolling • No tangled fishline • No Prop • Gets into the hard places where the fish really bite • Safe for children • Easy to Carry, Easy to Pack, Easy to Operate

Retail $169 NOW **$139** Includes separate 3 gal. gas tank and $5.95 extension handle FREE

ORDER NOW, PRICE SUBJECT TO CHANGE WITHOUT NOTICE
Send Check or M.O. — Week to 10-Day Delivery
Send for FREE information on Inboard Jet Units and Boats up to 350 Horsepower

PROPULSION RESEARCH, INC. • 7644 KNOX AVE. SO., DEPT. B • MINNEAPOLIS, MINN. 55423

Fabulous Pivot-Wing Plane

(Continued from page 218)

(because of problems of operating from carrier decks), and larger wings (for increased "loiter" characteristics).

The Navy F-111 will be used primarily for defense as an air-superiority weapon, patrolling the skies near fleet task forces. It will use, for the first time, the new *Phoenix* missile system developed by Hughes Aircraft Co. Still very hush-hush, the long-range missiles apparently are guided by radar from the F-111 cockpit, taking over with their own guidance system when they approach the target. The man in the right seat, incidentally, will not be a pilot, but a bombardier-navigator.

The Air Force F-111 will be used primarily for offense as a penetration and interdiction weapon. It will fly at all levels from the deck to the stratosphere, and will have the ability to fly anywhere in the world in one day and land on sod fields. It will carry two pilots.

Val Prahl, another of the test pilots who flew on several of the F-111's early missions, provided a pilot's reaction to this remarkable new machine. His attitude, while "gung ho" enough, is surprisingly placid. Apparently, in spite of the weird wings, there is nothing exotic about the plane's handling characteristics. His first remark was: "It flies like an airplane."

Prahl explained that, for a normal take-off, the wings are spread fully—about 16 degrees from perpendicular—with slats and flaps down. For landing, about 26 degrees of sweep is used. Climbs, descents and most subsonic flying have been done (to date) with about 50 degrees.

Prahl said that, in the Air Force version, the cockpit—the first side-by-side seating for a fighter plane—is compact but not cramped. While each man can fly the plane, the flight and engine instruments are oriented mostly toward the man on the left, and the weapon instruments toward the right.

General Dynamics has announced that its first two Air Force F-111s would be undergoing flight tests at Edwards Air Force Base in California in May, and Grumman has announced that it would unveil the first Navy F-111 on Long Island early the same month.

So, the F-111s are rolling off the line. We'll soon learn whether their performance will overcome the controversy they caused, and whether they can, indeed, fly into history as one of aviation's great and significant aircraft. ★★★

HOW TO MIX PLEASURE. FUN. AND PROFIT

OWN A TRIUMPH!

FUN Turns leisure hours into fun. Sparetime doesn't drag. You have something to do, somewhere to go. Triumph from the Rockies to Cape Cod, from the deep South to our big Northwest. Designed for cross-country, highway, racing or open field riding. Even climbs mountains. Used by sportsmen to get where the hunting and fishing are choice.

PLEASURE Even going to work or school can be a pleasure. Takes the drudgery out of driving to work. Triumph maneuverability enables you to weave through traffic. Simplifies all parking problems.

PROFIT Every Triumph mile earns you savings compared with a car. In gas alone, of course. But maintenance costs and spare parts are low, too. With your own swift transportation you can cash in on opportunities that will come your way, after school or week ends.

Johnson Motors, Inc.
WEST... P. O. Box 457, Pasadena, Calif. 91102

The TRIUMPH Corporation,
EAST... Baltimore, Maryland 21204

Name ..... Age .....
PLEASE PRINT
Street .....
City ..... State .....
Telephone Number ..... Dept. P.

The New T120/R Bonneville Twin Carburetors 650 c.c. engine

Super-powered unitized engine-gear box construction • 1⅛" AMAL Monobloc carburetors • High performance pistons • Twin chrome-plated downswept exhaust pipes • Low output AC alternator • Two high tension ignition coils • Sports-type chrome headlight and ammeter • Horn • Swinging-arm rear suspension • Trophy-type telescopic hydraulic front forks • Speedometer and Tachometer with anti-vibration mounting • 3½-gal. sports-type gas tank • New Pacific Blue and Silver Finish.

See your nearest Triumph dealer for information. He'll help you choose the Triumph model best suited to you. Ask for a test ride, too.

HOW MANY
HANDY DANDYS
DO YOU NEED?

Handy Dandys are sturdy, plastic caps that snap into 1/8" pegboard and securely hold quarter-twist glass jars such as those used for baby food. If you are up to your neck in saved baby food jars (or you know someone who is), put those jars to work. With Handy Dandys you can make your workshop neat and clean. Perfect for storing nuts, bolts, cotter pins, washers, screws, fuses, small tools and other important items needed around the house and shop. Handy Dandy positively keeps contents dustproof. Just what you've been looking for. Put a pegboard on the back of a door for mama with Handy Dandys for buttons, pins, rubber bands, clips, stamps, etc. Have the things you need at your fingertips—inexpensively—with Handy Dandys. Sample order 12 for $1.00; 3 dozen for $2.50; 6 dozen for $4.00; 500 for $25.00. Shipped USA postage prepaid. Include payment with order—no C.O.D.'s. Order enough, you'll want more when you start using Handy Dandys. Available from manufacturer only.

WICKLIFFE INDUSTRIES, INC. Wickliffe, Ohio 44092

BUILD YOUR OWN CAMPER AND SAVE!

ALSO TRAILER OR PICKUP-COVER

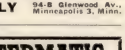
Complete, easy to follow plans, instructions, material list... $3.95 ea.

Bus Conversion and Houseboat Interiors drawings..... $2.95

EQUIPMENT CATALOG—$1.00 (Refundable on first order)

Satisfaction Guaranteed! Send Check Or M.O.—For Details Send Dime.

VIKING CAMPER SUPPLY 94-B Glenwood Av., Minneapolis 3, Minn.



ROUTERMATIC
MAKES EVERY MAN AN EXPERT WOODWORKER

Clamp this amazing tool to your electric drill and route, mortise, trim, shape, mitre and tenon like a professional cabinet maker. Even inlays become easy.

Handles any job better by letting you take the tool to the work. Routermatic is precision made, sturdy, lightweight. Use it once and you'll wonder how you ever got along without it. Only $6.95 including $1.50 router bit. No C.O.D.'s. Can't be sold thru stores at this low price. Descriptive folder on request.

COMP-TOOL, Inc. 355 Prospect Rd., Ashtabula, Ohio

HOW TO FINISH WOOD

Get this 32-page full color book written by experts. Tells how to obtain professional finish on interior and exterior natural wood. Floors, wall paneling, antiques, boats, many more. Only 25 cents p.p. Send coin today.

McCLOSKEY VARNISH COMPANY
DEPT. PM5, 7600 STATE RD., PHILADELPHIA 36, PA.

GOVT. SURPLUS AND OTHER BARGAINS SAVE UP TO 90%

GEAR HEAD MOTOR A truly versatile, compact, heavy duty geared motor. Turns 65 RPM under load & up to 120 RPM no load. Develops 150 In.- Lbs. equally well on 12 V or 24 V.D.C. Has dual 9/16" drive shaft, 1/3 to 1 reduction. Excellent for use as a small boat winch, garage door closer, toy cars, etc. 10" L x 3¼" H x 6½" W. Tested prior to shipment. Approx. GOV'T COST $123. Now **$12.50**

12V RETRACTABLE LIGHT Contains 8" seal beam light, 250 watts. Self-contained 12V retract motor drives light mechanism from 0° to 90°. Excellent for trucks, tractors, construction, hunting, etc. Shpg. wt. 9 lbs. NEW. Approx. GOV'T COST $65. Only **$9.95**.

HEAVY DUTY MAGNET Fantastic power, will pull 125 lbs. on steel. Excellent as underwater retriever. Picks up all ferrous metals. Dim. 4" x 2" x 1¾". **$7.95**.

HEAVY DUTY HYDRAULIC CYLINDER Originally used as a main landing gear actuating cylinder. Operating pressure 1500 PSI. Port size ¾ x 14 thd. Steel cover protects against pressure out. Stroke 35". Shaft 3¼". Bore 4½". Closed length 33¼". Open length eye to eye 48½". Excellent for use on dump trucks, hoists, presses, etc. Like new. Shpg. wt. 75 lbs. Approx. GOV'T COST $175. Now **$22.50**

DC JET GENERATOR ARC WELDING KIT Complete with GE Type CM-77 Generator (30 volts D.C., 400 Amp., 3000 RPM up; ampere rating is for continuous duty, intermittent amperage is 500 to 600 amps.), also 2 rheostats, 1 voltage relay, 1 voltmeter, 1 electrode holder, 1 welder's mask, 1 toggle switch, 10 ft. vacuum jacket ¼ in. welding rod, fair weather gloves & spline coupling. All units guaranteed pre-tested. Wt. 110 lbs. Approx. GOV'T COST $700. All items, now only **$64.50**.

ELECTRIC STORAGE BATTERY WINCH

For use on 12 V.D.C. Heavy-duty ball bearing construction 160-1 gear reduction. Reversible spool will handle 80' of ¼" cable. 2000 lb. capacity. Ready to install & operate. 19½" L x 9½" W x 8½" H. Excellent for jeeps, trucks, boats, etc. Complete with mounting bracket. Shpg. wt. 60 lbs. Approx. GOV'T COST $400. New Model E. 90-day guarantee. $59.50 incl. Fed. Tax.

NEW! BIG! 1965 CATALOG

SEND FOR IT NOW! FREE! 1965 CATALOG 196 PAGES 98% ILLUSTRATIONS

Send 25c (no stamps please) for copy of amazing catalog with 1000's of bargains in hydraulics, electric precision tools, marine & automotive items, etc. for hobbyist or industry. Order from this ad. All prices FOB Culver City, Calif. 50% deposit for COD. Send check, cash or money order in confidence— we've been satisfying mail order customers throughout the world since 1945.

AIRBORNE SALES CO. PM565
8501 Stellar Drive • Culver City, Calif., Box 2727

EAT ANYTHING WITH FALSE TEETH

Trouble with loose plates that slip, rock or cause sore gums? Try Brimms Plasti-Liner. One application makes plates fit *snugly without powder, pads or cushions.* Brimms Plasti-Liner adheres permanently to your plate; ends the bother of temporary applications. With plates held firmly by Plasti-Liner, **YOU CAN EAT ANYTHING!** Simply lay soft strip of Plasti-Liner on troublesome upper or lower. Bite and it molds perfectly. *Easy to use,* tasteless, odorless, harmless to you and your plates. Removable as directed. Money-back guarantee. At your drug counter. $1.50 reliner for one plate; $2.50 for two plates. Plasti-Liner, Inc., Dept. 22-P, 1075 Main Street, Buffalo 9, New York.

BRIMMS PLASTI-LINER
THE PERMANENT DENTURE RELINER

QUICK-WEDGE

SCREW-HOLDING SCREWDRIVER

HOLDS THE SCREW so firmly, the screw virtually becomes part of the screw driver, to help you

START THE SCREW anywhere . . . even in hard to get at places, then . . .

DRIVES THE SCREW straight, to save time, energy and your frayed nerves

Plus they're UNCONDITIONALLY GUARANTEED

Try one at your dealers or write

KEDMAN COMPANY, Box 267, Salt Lake City, Utah 84110

HIGHLIGHT YOUR TRAVEL PLEASURES !!
CAPTURE EXOTIC SCENES AND EVENTS !!

Buy your cameras (all brands and all models —world famous), at fantastic savings (when you visit Tokyo, or have your friends buy one for you if they plan a journey soon).
PLUS TAX FREE PRIVILEGES!

An example: **Nikon F Photomic F: 1.4** at $193.22 with case ($458.50 Stateside)

For further particulars write to :

FUTAMI Camera Co. (Est. 1926) : 2, 4-chome, Ginza, Tokyo, Japan

HERO Camera Co., Ltd. : 5, 4-chome, Nishi-Ginza, Tokyo, Japan

SANKEI Photo & Radio Service : Hotel Okura Arcade, Tokyo, Japan

SUGA Photo Supplies Inc. : Imperial Hotel Arcade, Tokyo, Japan

Unmasking Mars

(Continued from page 82)

Alderamin, Regulus, Naos and Gamma Vela—that are seen in our southern sky.

Attitude data sent back by Mariner told technicians in JPL's Pasadena nerve center that the sensor still hadn't found Canopus. In each case, a radio signal was sent to the craft, breaking the sensor's "seeing" circuit. Gyros would then cause the craft to roll again. The rolling search finally effected a lock on Canopus.

Later, Mariner lost the lock briefly. The ground handlers ordered it to find Canopus again. The craft did just that.

Course Changed Enroute

Mariner was 440,000 miles from Earth when the most critical maneuver of the trip was made. Had anything or anyone failed at this point, the entire experiment would have been a washout.

The problem was to make a slight change in Mariner's course. If it continued on its trajectory, it would cross the path of Mars about 150,000 miles *ahead* of the planet, too far to carry out most of its investigations.

Besides, JPL scientists wanted the vehicle to pass *behind* Mars in order to perform the previously described occultation experiment, and to get the best angle of sunlight for photographs. They also wanted the vehicle to pass within 9000 miles of Mars. But even a pass no closer than 54,000 miles could produce some useful information. On the other hand, should the spacecraft approach within 1000 miles, scientists fear that the Martian gravity would capture it and make it crash. Mariner is unsterilized; if it hit Mars it could contaminate the planet with microorganisms from Earth.

[*The theory that a very close pass would result in a crash may be tested next August 9. That's the reported target date for a Russian craft, Zond-2, to pass within only 900 miles of Mars. The American space expert who disclosed this information said the Russian probe "may be doing something more than a simple flyby." Zond-2, reported to weigh more than three times as much as its American rival, was launched Nov. 30, 1964, two days after Mariner.*]

Like Hitting Second Base

At 7:25 a.m. Dec. 5, 1964, Mariner's handlers commanded the craft to break its lock on the sun and Canopus and to roll until its small midcourse rocket was in correct firing position. A 30-second "burn" of the 50.7-pound-thrust rocket

(Please turn to page 224)

If you want to STOP SMOKING here's how!

by Whitey Ford

The famous Major League pitcher who holds the most World Series records tells what happened when he decided smoking was not good for his physical fitness.

I talked to my doctor about smoking and he advised me to quit. I did. But it was hard. Then I heard about a little pill called Bantron. I was surprised to find that it helped a lot to keep me from smoking. Now, when I feel like relapsing, I just take Bantron instead.

Bantron was discovered by doctors in the research department of a great American University. Tests on hundreds of people showed that it helped more than 4 out of 5 of *all* people who wanted to stop smoking to do so in five to seven days. Even those who didn't stop completely had drastically cut down.

And the Bantron way is so easy and pleasant! Bantron does not affect your taste, is not habit forming. It acts as a substitute for the nicotine in your system, and curbs your desire for tobacco.

Try Bantron. You will be amazed at the results you get. It's so safe when taken as directed, that you can get it at all drug stores without a prescription. Also available in Canada.

Bantron BRAND ®
Smoking Deterrent Tablets

To Make and Sell Ornamental Concrete Items
You Need MOLDS

For Thorough Info On Over 300 Different Molds You Can Buy And Use Plus Complete Start To Finish Professional Instructions

RUSH $2.00 for book

TURN CONCRETE INTO GOLD

CONCRETE MACHINERY COMPANY, INC.
839 Lenoir Rd. - P. O. Box 99 - Hickory 2, N. C.

World's fastest growing Sport Machine for Summer and Winter fun.

CAT-A-GATOR
NEW POWER-PLUS ALL TERRAIN VEHICLE
Ideal For
SPORTSMEN
RESORTS
MARINAS
AIRLINES
SKI LODGES
And Many Others
PRICES START at
$1695.00
Track and Dozer Blade Optional
FOR A FREE CATALOG PLEASE WRITE

CAT-A-GATOR

P.O. Box 6327
Richfield, Minn.

50 ft. 8MM Color Movie Film available to Dealers. Send $10.00.

Write about a Dealership in your area

Write for free color catalog.
Lone Star
LONE STAR BOAT COMPANY

Headquarters Plant: 1062 Industrial Ave. • Plano, Texas

Of Course...

Red Top Air Filters Are Better!

WIX didn't put the "Red Top" on Polymite Air Filters for "kicks." That distinguishing feature identifies a technically improved product...one which is nearly impossible to install in the car upside down. The part number is imbedded in the "Red Top"—not stamped on. That's mighty useful when it's time to change the Filter.

The technical improvements that save you money are: positive seals to prevent leaking dirty air and "Arch Pleats" for greater efficiency, more mileage and greater savings on gasoline. "Arch Pleats" are important where the pleats of ordinary filters pinch together and impede the flow of air halfway down the fold, the "Arch Pleat" does not collapse. Thus, you get a bonus in extra value and substantially greater mileage.

Ask your service man for WIX Polymite Air Filters. Don't let him kid you about all Air Filters being the same. If he doesn't have WIX, call up a local WIX jobber...he'll tell you where you can get them.

WIX® FILTERS

WIX CORPORATION • GASTONIA, N. C.
THE GOLD STANDARD IN FILTRATION

Unmasking Mars

(Continued from page 222)

would increase orbital speed by exactly 29 mph. That would be sufficient, JPL engineers figured, to put Mariner within 5400 miles of the planet at flyby. An error of only 1 mph in acceleration would throw the craft 9000 miles off the mark. But there were no errors. Course was altered almost to perfection.

"It's like shooting from Los Angeles to New York," one JPL official commented, "and trying to hit home plate in Yankee Stadium—but actually hitting second base."

It is possible, of course, that hitches may still develop on the final leg of the trip. But even if the entire experiment should founder now, in some unaccountable outer-space catastrophe, Mariner already has made contributions to our knowledge of space. Millions of bits of information have been pouring into the Pasadena center about things such as radiation in space, cosmic rays and magnetic fields.

Mariner's photo mission will begin when the craft is 75 minutes from its closest approach to Mars—about 9000 miles from the surface.

First, a scan platform will sweep the TV camera and two planet sensors—one wide-angle, the other narrow—through a 180-degree search arc. "To the wide-angle sensor, Mars will look like a light bulb," explains Denton Allen, a JPL engineer. "The sensor's job is to find the bulb and home on it."

As Mariner gets closer, the narrow-angle sensor—its field of vision is 1½ degrees—refines the aim of the camera. On command from the electronic brain, the camera will begin taking its 21 photos, one every 48 seconds. The images will be stored on tape and not transmitted until Mariner has emerged from behind Mars.

Nail-Biting Climax

Because each picture consists of about 250,000 bits of data, and the transmission rate is only 8.3 bits per second, eight hours are required to send back a single photo. Between photos, Mariner is programmed to transmit an hour and a half's worth of engineering data. So, even if all goes well the entire set of pictures won't be received by JPL scientists until 210 hours—nearly 10 days—after Mariner's flyby.

But if this fantastic feat is carried off, if Mariner radios that it will begin to transmit its first picture of Mars across the more than 134 million miles to Earth—that surely will signal the start of one of the most suspense-packed waiting periods in the history of man. ★★★

ELECTRIC ARC WELDER $14.95!

MAKE—REPAIR MOST ANYTHING MADE OF METAL!

LIFETIME BURNOUT GUARANTEE—10 day money back trial!

Works on 110 volt plug in. 10 WAYS WELDS, BRAZES, SOLDERS, CHARGES WELDING RODS, HEATS, SOFTENS, LOOSENS, THAWS, BENDS, joins ANYTHING. COMPLETE READY TO USE WITH face mask, clamps, arc torch, rod holder cables—and supply of welding, brazing carbon, solder rods, flux

ARC WELDING INSTRUCTION BOOK—Tells how YOU can use for CARS—HOME—FARM—SHOP or FACTORY. all 10 WAYS—NO EXPERIENCE NEEDED!

SEND ONLY $2.00 (cash, ck, M.O.) and pay postman $12.95 + C.O.D. postage. Or send $14.95 for ppd. and save postage. WRITE FOR THE MONEY-SAVING IN THE WORLD. FREE.

EXTRA "Heliotex" dark goggles of you order from this ad. Sold ONLY by **MIDWAY WELDER, Dept. DPM-5, Kearney, Nebraska.**

LAN-LIN
HAND CLEANER

Cleans Hands With or Without Water
Removes Grease, Grime, Stains, Paint, Ink . . . Safely!

RUB ON—RINSE OR WIPE OFF

At Service Stations, Auto & Hardware Stores

Solves Repair Problems

Durham's fills cracks and holes in plaster, wood and tile. Won't shrink or fall out. Economical, easy to use. Big 4-lb. can, only 1.60 at lumber, paint, and hardware dealers, or shipped direct postpaid in U. S. for $2.00. Money-back guarantee. Order now. Donald Durham Co., Box 804-T, Des Moines, Iowa.

this is not a butter knife!

A butter knife never had it so good! Our putty knife goes through 14 steps to insure perfection. Any Red Devil tool you buy is your best buy. At paint, hardware, variety stores. ■ Try Schalk's Super Savabrush Cleaner — another fine Schalk Home Repair Product.

WRITE FOR FREE PAINTING HINTS BOOKLET

Red Devil Tools.
Dept. PM-5 2400 Vauxhall Road
Union, New Jersey

Since 1872

14779-1

Here's how to refurbish your boat in 8 hours with

NAUTOLEX®
SUPPORTED VINYL MARINE FABRICS

1. Eleven year old hull still sound, but deck needs refinishing. Nautolex eliminates days of hard work, restores beauty at low cost.

2. Wood deck has been faired, sanded. Nautolex vinyl decking cut to fit. Mastic bonds Nautolex to wood.

3. Ready! Looks like fine wood, yet Nautolex is scuff-proof, resists oils, gas, alcohol, weather. Wipes clean with soap and water. Available in 17 patterns and colors. At marine stores.

To: THE GENERAL TIRE & RUBBER COMPANY,
TOLEDO, OHIO
DEPT. PM-3

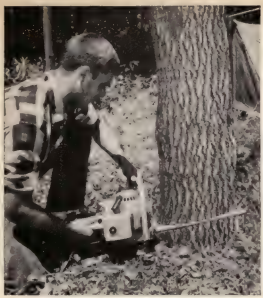
Send FREE SAMPLE OF NAUTOLEX and literature without obligation.

GENERAL TIRE T.M.
TOP QUALITY FOR 50 YEARS

NAME _____

ADDRESS _____

CITY _____ STATE _____



CAMPERS' BEST FRIEND

NEW HOMELITE SUPER XL

Here is the perfect combination of light weight and super power . . . the best saw yet for clearing land, building cabins, cutting fence posts or firewood. Pick it up. Weighs only 13 lbs., 12 oz., less bar and chain. Try it. Feel its power. Cuts 18" softwood in 17 seconds, 18" hardwood in 24 seconds. Fells trees up to 4 ft. in dia.

The Super XL, rugged and perfectly balanced, has a new, more powerful engine, plus a new muffler to smother noise. Added, of course, are all the famous Homelite professional features that make it easier to start, run, control and operate regardless of cutting position.

With its flush-cut handle, you can cut flat with the ground. You can have 12" to 36" straight blades, plunge cut bow, or clearing bar. Consult your yellow pages for names of your nearest dealers.

HOMELITE A textron DIVISION
10205 RIVERDALE AVE., PORT CHESTER, N.Y.

Who'll Win at Indy?

(Continued from page 77)

from 1 to 100. As the leader crosses the starting line during yellow-light periods, the hand on the clock is punched back to zero. The man in second spot, running, let's say, 15 seconds behind, would know his position as soon as he crossed the line. If next time around he cut the leader's advantage to five seconds, he'd know that on the third lap under the yellow he'd have to drop back 10 seconds or be called in for a conference.

"As for pitting during the yellow, if it's a minor accident where the imposed slowdown isn't drastic, it won't help much. But on a long, slow yellow, it can save you one or two thirds of a lap."

We also got varying opinions on the new rule requiring at least two pit stops.

"They should have made it three," said Foyt. "No one would have to carry as much fuel, and the race would be safer and just as fast."

Jones agreed: "With a lighter load of fuel, you can run a little faster. We plan on three stops anyway, figuring the light load will make the car easier to handle."

Ward dissented: "Two stops are more than enough. Some cars may need three. This still puts a premium on choosing the right fuel blend for both staying power and peak horsepower."

Many experts feel the new regulation requiring two pit stops is a camouflaged effort to eliminate gasoline, whose only real advantage in the 500 is better mileage (by at least 50 percent). There's a general opinion that gasoline is more dangerous, but without scientific proof there was no justifiable reason to outlaw it.

We asked Jack Zink about this. A combustion specialist, Zink owned the winning cars of '55 and '56.

"One racing fuel isn't inherently more dangerous than another," he said, "but gasoline produces dense black smoke when burning in the open. This can cut visibility to zero." He proposed a smoke test, using instruments he developed, for various fuels.

He's happy about the two-stop rule, since his driver will be able to run lighter, but says, "Philosophically, I'm against it. The idea is to go 500 miles the quickest way, and any artificial restriction waters that down."

Pit stops will be more challenging this year, because another new rule has outlawed refueling with CO_2-pressurized tanks, which push more than 160 gallons a minute through four-inch hoses. Now gravity feed is the rule. Complicating this are saddle tanks along each side of rear-

(Please turn to page 228)

EVERLITE* World's THRIFTIEST Light Plants

THE CHAMPION 1200 WATTS, 115 VOLTS AC

Now a Service Free Light Plant built with a transistorized alternator. Offers 60% greater efficiency—more power for less fuel. Terrific service life—no brushes to arc and burn. No more commutator to wear, no collector ring trouble. And best of all it costs no more to "go modern with Everlite." Thrifty 1200 watt, 115v. AC plant powered by a rugged easy starting 4 cycle engine—leader priced. Model 860-127. Wt. 65 lbs. as illustrated ..... **139.95** f.o.b. factory

*Trade-Mark Registered All sizes available—can finance. Write for catalog. Special models for public utilities—Approved for Civil Defense. Write

MASTER MECHANIC MFG. CO., Dept. A565 Burlington, Wis.

Southern Customers Write to Dept. A565, Box 65, Sarasota, Florida

Earn $100 to $150 A WEEK IN SPARE TIME!

Sell cones, shakes, sundaes, hamburgers, hotdogs, french fries, coffee, soft drinks. No experience needed. All supplies can be purchased locally. Complete including Chevrolet truck and all new, high-quality restaurant-type equipment. Only $3,995. Will finance on approved credit. Here's a great opportunity to make big, extra money without giving up your present job. When writing, give phone number.

FREEZ-KING, 1200 N. Homan, Chicago, Ill. 60651 Dept. P55

ELECTROPLATING

EQUIPMENT, SUPPLIES and INSTRUCTIONS for Home Workshop or Production Plant

Decorative Chrome, Hard Chrome, Precious Metals (Decorative & Electronics), Electro Polishing, Baby Shoe Metalizing and all other finishes. Also Portable Platers & Sample Plating Service. Send $1 (refundable) for formulas, operating data and catalog.

HBS Equipment Division-Dept. 165

3445 Union Pacific Avenue, Los Angeles 23, Calif.

NOW, BUY 1964 CARS DIRECT — BELOW WHOLESALE

only $999

POWER STEERING

'64 CHEVY BISCAYNE

ONLY 160 UNITS BUY NOW!

'64 FORD CUSTOM 300 ..... $899

'64 STUDEBAKER LARK $699

PLUS 4 NEW FIRESTONE TIRES

All 4 door, 6 cyl., automatics—good tires, spare, heaters. GUARANTEED IN PERFECT RUNNING CONDITION. Formerly taxies. All signs and markings removed. NO DIFFERENT THAN REGULAR PASSENGER CARS. $100 Deposit Holds One For You. No sales tax, clear titles. CALL, WIRE, WRITE LARRY SHANDEL.

201 HE 5-8400-1 N.Y.C. 212 CO 7-4440

FREE: WRITE FOR ACTUAL PHOTOS AND FACT BOOK

UNIVERSAL AUTO WHOLESALERS INC. - Est. 1959

Dept. PM-5, 990 Newark Ave., on Route 1 & 9, Jersey City, N.J. 07307

ONLY MOLLY DOES IT RIGHT!

Genuine MOLLY® Products **SCREW ANCHORS**

The perfect way to fasten anything to hollow walls, doors and ceilings. Insist on Molly Screw Anchors—Buy where you see this emblem.

Send $1.00 for sample box of 12

Molly Corp., Dept. G, Box 1139, Reading, Pa.

Enclosed is $_____ for ☐ sample boxes of Molly Screw Anchors

Name.....

Address.....

City.....State.....

REPAIR ANYTHING BUILD ANYTHING

STICKS LIKE A Leech®

CEMENTS • GLUES • ADHESIVES

ALL-PURPOSE GLUE KIT $1.00

YOU SAVE 27c. CONTAINS ADHESIVES FOR WOOD, PAPER, FABRICS, GLASS, LEATHER, POTTERY, ETC. SEND DEALER'S NAME, ADDRESS.

LEECH PRODUCTS, INC., HUTCHINSON, KANSAS

Look for Dixon Lubricants

in the handy, new jewel-like dispenser.

Available at hardware stores, service stations, bicycle shops, locksmiths and auto part stores.

THE JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J. 07303

What's so fine about a DIAMOND®

Who'll Win at Indy?

(Continued from page 226)

engined cars, connected by crossovers and regulators.

"It'll be tough to find an easy and safe way to fill a rear-engined car," said Jones, a victim of a poorly handled refueling operation last year.

"They should have kept pressure fueling as a safety factor," contended Foyt. "I don't think it ever caused a fire at Indianapolis."

"I don't think the change is bad," said Ward. "The pit stop will be longer for everyone. Again, it will stimulate people to do the job a little better."

Other Cars Entered

There'll be lots of other drivers, car builders and pit crews also trying to do the job "a little better." Jimmy McElreath, a top young Indy driver, will have one of two new rear-engined cars patterned after the one built and driven last year by Jack Brabham, but stiffer and stronger. Both will use Offy power, but a new, lighter Offy engine, expected to be fully competitive. An early version of this car did 159.5 mph at Indy during tire tests.

Mario Andretti, an Indy rookie who scored impressively on the '64 USAC circuit, will drive another Brabham-type rear-engined car. Probably it will run an Offy engine.

Dan Gurney, an early leader in the Indy rear-engine revolution, had planned to drive a new Brabham, but his success in Europe resulted in so many orders for the Brabham factory that the star salesman had to look elsewhere for a new car. "Powered by Ford," of course, Gurney will be driving a new car built by his crew from parts supplied by Ted Halibrand, manufacturer of Indy running gear and cast magnesium wheels. Halibrand's aircraft-type design uses magnesium circumferential frame castings around which the aluminum body shell is built. Two of these cars performed well in practice and qualified last year.

Ford's Horses Upped

Jimmy Clark, a star performer for the past two years, leads a team of three new Lotus-Fords.

The Novi team will enter two front-engined, four-wheel-drive cars. The Novi engines now rev much higher—close to 10,000 rpm. Bob Unser will have his pick of the car built by Ferguson for last year's race (it made a fine qualifying time, but was lost in the second-lap accident) or a home-built twin.

(Please turn to page 230)

ALL-PURPOSE SEALER CAULKS TUBS, SETS TILE, SEALS CRACKS PERMANENTLY

Just one of the DARWORTH CANS THAT CAN DO! Get the others, too!

Good Housekeeping GUARANTEED — IF PRODUCT OR PERFORMANCE DISSATISFIES REPLACEMENT OR REFUND TO CONSUMER

DARWORTH, INC., L.W. FERDINAND DIV., SIMSBURY, CONN.

INCREDIBLE UNIMAT!

Makes gears, bearings, wheels, axles, pinions, etc. Turns, threads, bores, drills, mills, grinds, buffs, polishes ...900-7200 rpm. Complete machine shop in 16".

BASIC UNIMAT: $139.50 (includes high-efficiency motor)
WRITE FOR FREE CATALOG.
AMERICAN EDELSTAAL, INC., Dept. G-E5, 350 B'way, N.Y. 13, N.Y.

AIR SUPPLY *for Trailers and Boats*

Supplies air wherever needed for inflating, painting, spraying. Operates from any 12 V. auto or other 12 V. battery. 25 lbs. maximum working pressure. 15 ft. air hose and 6 ft. cord with battery terminal clips included.

Only $29.95 *postpaid.* Money and shipping costs refunded if not completely satisfied after 10 day trial. Order NOW!

The K. J. MILLER CORPORATION
8846 W. 47th Street
Brookfield, Ill. 60513

Shrinks Hemorrhoids New Way Without Surgery Stops Itch – Relieves Pain

For the first time science has found a new healing substance with the astonishing ability to shrink hemorrhoids and to relieve pain — without surgery.

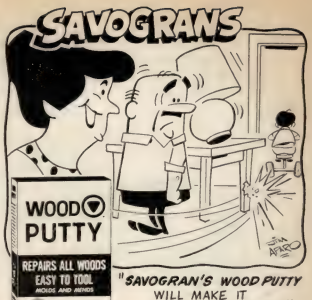
In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all — results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne®) — discovery of a world-famous research institute.

This substance is now available in *suppository* or *ointment form* under the name *Preparation H®*. Ask for it at all drug counters.

SAVOGRANS



"SAVOGRAN'S WOOD PUTTY WILL MAKE IT AS GOOD AS NEW!"

IT IS . . . a powder to be mixed with water into a smooth paste. Inexpensive . . . it can be colored to match woods.

IT DOES . . . fill cracks, gouges or holes. Begins to harden in 15 minutes. When set, it can be shaved, carved, sawed, sanded. Will never shrink or pop out.

"Where Paint Is Sold"

SAVOGRAN
NORWOOD, MASS.
Addison, Ill. Los Angeles, Cal.

HIGH-POWERED **motorcycling fun**

with a
1965 BSA THUNDERBOLT

BSA brings you a fast 40 cubic inch twin for touring enjoyment. A superb design giving finest handling, the BSA Thunderbolt has chromed full valanced fenders, chrome on tank sides and on many details, polished alloy engine-gearbox unit, and rich metallic blue finish. See it for yourself at your BSA dealer.

BSA MOTORCYCLES

Write to nearest address for free catalog of 1965 models.

Catalog offer limited to U.S. residents only

West:	East:
BSA Motorcycles-Western	***BSA Incorporated***
Dept. P-55	Dept. P-55
3074 Broadway	639 Passaic Ave.
Oakland, California	Nutley, New Jersey

USE POWER TOOLS AS NEVER BEFORE

DRILL CONCRETE, TILE...DRIVE SCREWS

New, transistorized *Bridgeport Power Tool Speed Control* gives you a full range of speeds with *useful power*. Saves cost of built-in controls. Makes tools do more jobs. Slow sabre saw and get precise cuts in hard material. Blades last 10 times as long. Cut a small radius without breaking blades. Drive screws with regular 1/4" or 3/8" drill at "control speeds" without gouging woodwork. Run your sander at speeds that won't gouge wood or metal. Buff your car without burning finish. Use floor polisher as scrubber without splashing. You can even have dimming control for floor lamps. Automatic built-in protection for safety. Capacity 7.5 amps or 900 watts, 120 volts AC input. Satisfaction completely guaranteed. Only $16.95 at hardware stores. Or order direct. Send check or money order. We'll ship postage paid by return mail.

BRIDGEPORT HARDWARE MFG. CORP.
BRIDGEPORT, CONNECTICUT 06605

ENJOY YOUR OWN BUSINESS
Start earning at once—No special experience required

A SHOP IN ITSELF—AUTOMATIC FOOLPROOF

STAND-ALL Model 7

Sharpens & Retooths Hand Saws 4 point through 16 point. SHARPENS—BAND SAWS—HACK SAWS—WOOD AND METAL CUTTING SAWS with straight back and identical tooth profile.

Crown adjusts to any Standard Crown. HOOK ADJUSTS from —5 to 21 degrees. BEVEL ADJUSTS from 0 to 30 degrees.

We Have Available If Wanted A Low Monthly Payment Lease Program

SMITH-NIELSEN EQUIPMENT CO.
Mfg. of Saw Grinders—Distributor of Complete Saw Shop Equipment
Box 2505 Terminal Annex—Spokane, Washington 99220—FA 8-6680

Wash away **oil and grease spots on concrete!**

New de-greaser quickly removes ugly surface grease from concrete driveways, carports, garage floors • Just apply, brush in with broom, flush clean with water • Also removes cooking oil stains from patios and hardened grease and oil from car engines, other mechanical equipment

Klean-Strip's
DRIVEWAY CLEANER
The Klean-Strip Co., Inc.—Memphis, Tenn.—Winnipeg, Man.

Who'll Win at Indy?

(Continued from page 228)

But the engine behind most of this year's entries will be the Ford V8. Horsepower is up from 475 hp at 8000 rpm to 495 at 8800. At Indy, rpm means speed. It allows lower gearing for better acceleration.

Oil passages are less restrictive, and the oil pump puts out 30 psi more. Con rods and caps are beefier, and camshaft diameter is increased to reduce deflection. A boost venturi added to the fuel injection gives better mixing of fuel for increased economy.

In the past two years only selected teams were given the aluminum Ford V8s, and Ford technicians did all tuning. If something went wrong, the entire engine was replaced. One garage on Gasoline Alley was stacked with crates of replacement engines. Indy's top mechanics stood around—just watching.

Ford now sells its V8 to all comers, with Meyer & Drake the sales and service reps. This frees Ford of low-volume distribution, and keeps in business the company whose time-proved Offenhauser engine is rapidly being shoved aside by Ford.

This year, Ford has even okayed methanol. (The use of gasoline had been a Ford advertising feature, even though it cost about 40 hp and 3 mph at Indy.)

Smaller Engines Coming

Yes, we may be headed for a Ford-powered rut, but probably not as deep as the Offy roadster rut. As Ward puts it, "The next logical step will be a switch to smaller displacement to get closer to European requirements. The wall is down between road racing and American track racing."

The Offy has just about reached its limit, and it's doubtful that any other manufacturer will try at this late date to catch up with Ford's $5 million Indy investment. But don't make any long-term predictions. Indy may well deserve its ultra-conservative reputation, but just when you start counting on it, somebody's garage doors open and out comes something new—like the handful of non-conformists entered this year.

Besides the four-wheel-drive Novis, there are two Mickey Thompson-built cars powered by rear-mounted Chevrolet engines with four-overhead-cam conversions. One has front-wheel drive. Loss of traction because of rearward weight transfer during acceleration, a problem with front-wheel drive, will be combatted by locating accessories as far forward as possible, and by the new wide-tread tires, according to one of Thompson's mechanics.

(Please turn to page 232)

BUY GREAT NECK
HAND TOOLS
CHROME PLATED ADJUSTABLE TUBULAR HACK SAW
for long-lasting performance
Great Neck Tools

GREAT NECK SAW MFRS., Inc.
MINEOLA, N. Y. — SEE YOUR LOCAL STORE

FIX-IT-YOURSELF & SAVE

Swiss FORMULAS BLACK MAGIC® patch kits

"AN AUTOBODY REPAIR SHOP IN A KIT"

Quickly and easily mends rocker panels, fenders, doors and trunk lids. Won't crack. Can be painted.

HARDENS TO THE STRENGTH OF STEEL!

MENDS METAL, WOOD, PLASTIC

At Auto, Hardware & Discount Stores

SWISS LABORATORY INC. • Cleveland, Ohio 44114

GENUINE ALNICO **MAGNETS**

AMAZING, PERMANENT, NON-ELECTRIC, HIGHLY PRACTICAL. Conduct interesting experiments. Hundreds of uses. Retrieve valuable steel items such as guns, tackle from fresh or salt water, tools from tanks and drains. GUARANTEED. Try any magnet one week. Money back if you are not well pleased.

M-710 (Wt. 53 oz.) Has pull of 225 lbs. on steel block.....$18.50
M-625 (Wt. 70 oz.) Has pull of 125 lbs. on steel block.....$10.50
M-575 (Wt. 18 oz.) Has pull of 75 lbs. on steel block.....$ 7.50
M-500 (Wt. 13 oz.) Has pull of 50 lbs. on steel block.....$ 5.50
M- 90 (Wt. 5 oz.) Has pull of 15 lbs. on steel block.....$ 3.50
M- 44 Rod Magnets for Electric Guitars, 1/4" DIA. x 1 1/4". 12 for $ 4.00
M-300 Kit of flat bars—5 pairs (10 magnets).....$ 3.00
M-47 Hot pad magnets, 10 for $1.00.....50 for $ 4.87
M-35 Science experimenter Kit of 8 magnets.....$ 2.00

SEND M.O. OR CHECK—WE PAY POSTAGE—SORRY NO C.O.D.'s

MIAMI MAGNET COMPANY, 3240 N.W. 27th Ave., Miami, Fla. 33142

STOP AUTOMATIC TRANSMISSION TROUBLES

TRANS-MEDIC

- ELIMINATES SLIPPAGE
- SMOOTHS ROUGH SHIFTING
- CURES SLUGGISH ACTION

AT SERVICE STATIONS AND AUTO SUPPLY STORES

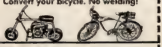
5 BAR GENERATOR $4.95!

Telephone type generator with 90 volt output. Will ring standard telephone bell. Good experimental item. Write for free list. Shipments FOB Simpson, Pa.

TELEPHONE ENGINEERING CO.
Dept. 5B5 Simpson, Penna.

FREE! Learn how you can buy engines $15.00, wheels $5.00, etc. with Confidential List!

- BUILD THIS MINI-BIKE! Complete frame for less than $10!
- MOTORIZE YOUR BICYCLE! Convert your bicycle. No welding!



RUSH 25c for Brochure Describing Plans
PLANS, Box 478, Dept. PM5 Denver, Colo.

8 times more power to stop pain of HEMORRHOIDS!

Soothing Nupercainal concentrates on pain! Prolonged relief of pain, burning and itching starts in minutes.

If you suffer from the misery of hemorrhoids, remember this about remedies you can buy for temporary relief. The leading "shrinking" preparation contains no anesthetic to relieve pain.

No wonder so many doctors recommend Nupercainal. Soothing Nupercainal stops pain, itching, burning fast . . . gives prolonged relief . . . because it has *over eight times more pain-killing power* than the other most commonly-used topical anesthetic!

Nupercainal quickly puts raw nerve ends to sleep . . . thus puts pain to sleep. Lets you go about your business . . . relieved of the stabbing pain, burning and itching torment of hemorrhoids. Get Nupercainal Ointment today—handy applicator with each tube. Start to live again, in comfort!

Nupercainal®
OINTMENT

Fill Flaws
In Plywood

Fill them *quick* with Plastic Wood. Handles like putty—hardens into wood. Easy to sand, paint or varnish.

For surest results always use GENUINE

PLASTIC WOOD

Handles like putty—hardens into wood!

Sure beats smoking!

Enjoy Copenhagen: Place a small pinch between cheek and gum. No chewing.

United States Tobacco Company

FREE LIVE SEAHORSES

Order LIVE MATED SEAHORSES sent Air Mail postpaid to your door. FREE food, catalog and simple instructions for raising these exotic little pets. Easy to keep in a jar, bowl or aquarium. The father seahorse gives birth to the young alive. Hardy, fascinating and easy to raise. GUARANTEED LIVE DELIVERY. MATED PAIR $2.25—2 PAIR SPEC (6) Order TWO PAIR $1.18 and receive another PAIR FREE (One address)

F. F. Marine Life P.O. Box 626-PM-65 Dania, Fla.

SAVE $80 AIR CONDITION YOUR OWN CAR

Easy! We supply everything you need, kit, tools, illustrated step-by-step instructions. Just 4 hours to install. Made by leading auto air conditioning manufacturer 12 month, 12,000 mile warranty. Our price to you just $149 (you save at least $80). Send $1 for complete instructions, applicable against purchase price. Please state make and year of car.

COMFY-KIT 1707 E. Ohio Street, Dallas, Texas Dept. 305

CLOSE-OUT SALE—$2.95

Science Milestones

(Regular Price: $4.95)

From Science Digest's Great Men of Science And Invention Series

- The dramatic record of the achievements of the giants of science—from Hippocrates to Edison to the pioneers of space flight.
- 312 pages of text and portraits, between handsome cloth covers, plus 50 added illustrations and diagrams.
- Biographical histories of such men as da Vinci, Newton, Fuller, Darwin, Mendel, Edison, Freud, Einstein and more—their theories and achievements.
- A luxuriously sized (8½" x 10¾") volume you will be proud to own. Not available elsewhere.

For your copy, fill out coupon and enclose check or money order in the amount of $2.95.

ORDER TODAY! QUANTITY LIMITED!

COUPON FOR SCIENCE MILESTONES

MAIL to Bureau of Information, Popular Mechanics, 575 Lexington Ave., N.Y., N.Y. 10022.

Please send me ( ) copies of *Science Milestones* postpaid at a price of only $2.95 each. My check ( ) money order ( ) is enclosed.

Name.....

Street Address.....

City.....State..... PM-5

Who'll Win at Indy?

(Continued from page 230)

The frame is essentially a 12-inch-diameter titanium tube (which also doubles as the fuel tank) just inside the right-hand wheels. Body skin and driver's seat are supported by brackets.

A pair of pushrod-Chevy-powered cars with offset chassis is being built for J. Frank Harrison, a Chattanooga, Tenn., sports-car enthusiast and newcomer to Indy. One car has an aluminum skin, the other a fiberglass one. The highest part of these cars—and the top of the driver's head—will be 32 inches off the ground, making them probably the lowest American-built entries. One builder has even designed a car with an Offy engine sitting transversely across the rear.

Who Will Win It?

With such a variety of cars entered, it's not easy to predict who has the best chance of winning. But we asked Ward, Jones and Foyt to try.

"I won't say Rodger or Parnelli or any of about 10 others who are harder to beat than the rest," said Foyt. "Any one good enough to make the race can win it easily. I've led plenty of races and even lapped the whole field on a mile track and then fallen out. Some driver whom I can beat nine times out of ten will go right by me. On this one day, he's right and really flying, and that's it."

"As A. J. said, everybody beats you if you fall out," Jones agreed. "But most of the competition will come from A. J., Rodger, Dan Gurney, Jim Clark, Roger McCluskey and Lloyd Ruby. Take some of these out if they're not in the right cars. On the other hand, there's always a rookie, in the right car, who'll surprise you. But a rookie is handicapped in not knowing what's going on. We're all glad they've raised the drivers' tests for rookies to 145 mph, closer to race speeds."

Ward chimed in: "Jim Clark and whoever's with him on the Lotus team will be tough. But the toughest on this track is Parnelli. He's the best at Indianapolis. Foyt is one of the great drivers of all time. He's the best from track to track, in my opinion. Gurney could be tougher this year; I feel he wasn't given the same equipment as Clark, and I think he's just as great. Roger McCluskey, who'll drive for Gurney, is also a great driver who could show his real potential. Bud Tinglestad could show more of his ability this year. McElreath could also get on this list."

I don't know what your guess is but to me the odds would seem to favor Ward this year. ★★★

Print Your Own

Cards, Stationery, Advertising, Circulars, labels, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too.

Own a Printing Business

Print for Others. Good Profit. Have home shop. Junior press $15; Senior $35 up. We supply everything. Easy rules. Pays for itself in short time. Write now for free details.

KELSEY PRESSES, Z-37 Meriden, Conn.

GUNK GP

BRUSH IT ON HOSE IT OFF

CLEANS

POWER MOWERS
GARAGE FLOORS

AT HARDWARE, FARM AND AUTO STORES

TOILET FOR ANY BASEMENT

FLUSHES UP *to* OVERHEAD
SEWER OR SEPTIC TANK.
NO DIGGING UP FLOORS.

McPHERSON, INC. BOX 15133 TAMPA, FLA.

SEND FOR JEWELRY CRAFTS FREE CATALOG

Lapidary—rockhounding—jewelry making... add up to a fascinating creative art!

JEWELRY CRAFTS CATALOG FREE

BIG SAVINGS NOW
ROCKHOUNDS
UP TO 33% OFF

over 10,000 items from all parts of the world.

MACHINERY—SUPPLIES—ETC.
MOUNTINGS—BOOKS—CRAFT TOOLS
STONES—JEWELRY MATERIALS

GRIEGER'S, INC.
Dept. 34—1633 E. Walnut—Pasadena, Calif.

New Water Adventure!

KLEPPER Foldaway

- Fits in any car
- Carried like luggage
- Easy, fast assembly
- Guaranteed sinkproof
- Perfect family boat
- Most economical
- 4 world awards
- Many new models
- Kayaks to sloops

Send today for FREE color catalog PM5

HANS KLEPPER, 35 Union Sq. West • New York 3, N.Y.

SAVE UP TO 85% GOV'T SURPLUS and NEW EQUIP'T

Send 25c For 3 Big Catalogs

PUMPS
WELDERS
WINCHES
SURVEYING
TELEPHONES
HYDRAULICS
GENERATORS

ELECTRONIC
BINOCULARS
GEAR MOTORS
COMPRESSORS
SPEED REDUCERS
WEED SPRAYING
MANY OTHERS

SURPLUS CENTER Dept. PM55 Lincoln, Nebraska

deft CLEAR INTERIOR WOOD FINISH

The *Complete* Wood Finish in One Can!

BRUSH IT! ROLL IT! SPRAY IT!

Wherever quality paint products are sold.

Write for FREE folder to DEFT, Inc.
P. O. Box 2216-N6, Torrance, California

40 AIRPLANES YOU CAN BUILD

LIGHT PLANE GUIDE

100 pages — 225 pictures

This "homebuilders bible" give you blueprint details, costs, specifications, performances, pros & cons on each of the popular homebuilt airplanes. Biplanes, parasols, mid-wings, low-wings. Send $1:

LIGHT PLANE GUIDE Homebuilt Issue, Dep't PM
14 W. Superior St., Duluth, Minn. 55802

DRAINS cellars, cisterns, wash tubs; **IRRIGATES - CIRCULATES - SPRAYS** **$8.95**

1,001 uses. Stainless shaft. Won't rust or clog! Use 1/6 HP motor or larger . . . 3/4 HP for up to 2,400 GPH; 450 GPH 40' high; or 1,800 GPH from 25' well. 1" inlet, 1¼" outlet. Coupling included free. **$8.95.**
HEAVY DUTY BALL-BEARING PUMP. Up to 3,200 GPH; 3,000 GPH from 25' well. 1½" inlet; 1" outlet. **$12.95**
Postpaid if cash with order. MONEY BACK GUARANTEE

Centrifugal and Gear Pumps in All Sizes

LABAWCO PUMPS, Belle Mead 7, New Jersey

WORKING WITH WOOD?

FILL HOLES, DENTS AND CRACKS WITH

Wood Patch

Makes a smoother job, blends with unfinished wood, no shrinkage.

Fills Nail Holes and Blemishes

Save finishing time . . . apply prefinished paneling . . . set nails . . . and putty last. Choice of 35 wood colors.

At Your Dealer, or Write

FIC FOREST INTERIORS CORP.
P.O. Box 1848, SEATTLE, WASH. 98111

DANA ANDREWS, Star of Stage, Screen and TV . . . Reports on AMERICA'S MOST REMARKABLE BUY IN PROFESSIONAL QUALITY POWER TOOLS...

DANA ANDREWS . . . Star of "CRACK IN THE WORLD" in Technicolor—a Paramount Release—writes . . . "Like most people, I guess, I sure had my doubts about how anyone could sell machines that are supposed to do so much . . . for so very little. I was never more pleasantly surprised! Every claim for them—and more—is true. Putting them through the most rugged workouts, has convinced me that the AMCO people know something no other manufacturer in America has been able to find out. These machines are, without question, a most remarkable buy in professional quality power tools."

BUY DIRECT FROM OUR FACTORY Amco POWER TOOLS SAVE AS MUCH AS 80%

8" TILT ARBOR POWER SAW

$14.95

f.o.b. factory. Wt. 25 lbs.

Includes completely assembled cast iron and steel 8" tilt arbor power saw with ground cast iron table . . . less blade. If desired, RIP FENCE for easier work alignment, $3.50 additional

REVOLUTIONARY PATENTS DECREASE COSTS, INCREASE EFFICIENCY Full scale power tools of heavy duty 100% cast iron and steel. Streamlined design reduces weight, cuts material and production costs. Special patents provide added efficiency, accuracy, savings. Parts made, assembled, tested and packed right in our own factories, shipped direct . . . save store profits.

DOES WORK OF $75 BENCH SAW as is. Converts easily to equal any $300 floor model cabinet units! Crosscuts, rips, mitres, cuts compound angles, dadoes, makes coves and mouldings. **FREE CABINET BASE PLANS** Use as portable bench saw as received (inset photo) . . . or transform easily and inexpensively into floor model (as shown) guar. to do work of floor models costing $300. FREE plans . . . sheet of ¾" plywood and 3-4 hours are all you'll need. Use your AMCO saw for cutting. Plans provide 27" x 24" work surface, 33" height, pullout saw-dust bin, tool storage compartment.

10-YEAR FULL SERVICE GUARANTEE

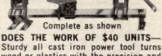
BLADE TILTS . . . TABLE STAYS LEVEL • Locks securely at any angle to 50°, raises, lowers 0"-2¼" • Patented tilt mechanism, accurate etched scale • Patented motor mount takes std. ¼ h.p. or larger motor, keeps belt tight, assures perfect alignment at any angle, transmits full power • Takes std. blade, saw insert removes to take dadoe heads, cutters, etc. (not incl.) • Accurate mitre gauge assembly • Ground spindle • Enclosed steel base • "Compo" bearings • Accessories available at factory prices • RIP FENCE, if desired for easier work alignment: Std. size (for bench saw) $3.50; larger fence (for cabinet base, as ill'd.) $4.50.

6" SWING 3-FT. LATHE

$9.85

f.o.b. factory

Optional Faceplate for turning bowls, trays, lamp bases, rosettes, etc. $2.50



Complete as shown

DOES THE WORK OF $40 UNITS—Sturdy all cast iron power tool turns wood or plastics with the precision and speed of machines selling for 4 times as much. Tubular steel bed, ball thrust cup center, spur center, T-Rest assembly, lever action tail stock, 2 speed pulley. Fits any motor.

10-YEAR FULL SERVICE GUARANTEE

FULL 22" LONG, 4¼" JOINTER-PLANER

$19.95

F.O.B. Factory Complete as shown

100% precision ground cast iron and steel.

DOES WORK OF $60 UNITS

Now, at little more than a hand tool price, a guaranteed professional quality precision machine which does same work as skilled hand planing . . . much faster, more accurately. Make accurate glue joints; rabetting cuts for doors, window frames, table drawers; square taper cuts for chair legs; accurate beveling.

• **Precision ground cast iron tables, adjustable for depth of cut** • **Rigid cast iron base** • **New patent-pending design holds clearance between knives and tables at any depth** • **Rabett depth ½"** • **Hardened, ground high speed steel knives** • **Patent-pending fence adjustable to any position, any angle 0°-50°** • **Patent pending lift-off guard (nothing to loosen!)** • **Balanced steel cutter head.**

10-YEAR FULL SERVICE GUARANTEE

UNCONDITIONAL 10-DAY MONEY BACK GUARANTEE

You must be fully satisfied. If not, return in 10 days, freight collect. Money refunded in full, no questions asked.

W OR GE 1/2 HP ELECTRIC MOTOR

SPECIAL AMCO PRICE (when purchased with any unit in this ad)

$12.95

f.o.b. factory

If purchased separately, $18.95

SPECIAL LIMITED TIME ONLY

Brand new factory-fresh motors for use with any of the units on this page. Limited quantity purchase . . . first come, first served. Wt.: 17 lbs.

FULL SERVICE 1-YEAR WARRANTY

Otherwise, as described below

32" RADIAL DRILL PRESS

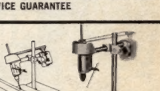
$29.95

F.O.B. Factory

½"Cap. Jacob's Chuck Inc.

Shipping Wt. 30 lbs.

DOES WORK OF $90 UNITS . . . AND A GREAT DEAL MORE



Industrial quality precision machine with all features of standard drill press, many extras. Head raises, lowers. Greatly increases depth of throat. Can be pre-set to any angle or position for on-or-off table drilling . . . even horizontal drilling. All cast iron and steel.

10-YEAR FULL SERVICE GUARANTEE

10-YEAR FULL SERVICE GUARANTEE Any part or parts of any AMCO power tool which may become inoperative for any reason within ten years after the purchase date will be repaired or replaced by the factory without cost to the purchaser. Your only cost: for postage.

MAIL COUPON TODAY!

AMERICAN MACHINE & TOOL CO., Dept. PM-55A, Royersford, Pa.

Please send me the units checked. Payment in full enclosed $ ..... or $3 deposit each item ordered, balance C.O.D. ☐ I MUST BE FULLY SATISFIED OR WILL RETURN UNIT WITHIN 10 DAYS FOR FULL REFUND. No questions asked.

☐ **8" Power Saw at $14.95** ☐ **Jointer-Planer at $19.95**
☐ **Standard Rip Fence #354 at $3.50** ☐ **Lathe at $9.85**
☐ **Long Rip Fence #354C at $4.50** ☐ **Drill Press at $29.95**
1/2 hp GE Motor: ☐ **$12.95 (purchased with other item)**
☐ **$18.95 (if purchased separately)**

NAME .....

ADDRESS .....

CITY ..... ZONE/ZIP ..... STATE .....

the outside paint

the insiders use. People who know, use MoorGard. Word is getting around—new Low Lustre finish—slips on with ease—dries "bug free" in minutes, tools clean up in water. MoorGard Latex House Paint is your Magic Film of protection.

Benjamin Moore® paints

The little Evinrude is the BIG one.

You're looking at a revolution in outboard motor design.

The motor on the right is the fishing man's perennial favorite—the Evinrude 5½ hp FISHERMAN — smoothest, quietest, most popular fishing motor ever built.

The motor on the left is the new 6 horsepower FISHERMAN.

Same full-range quiet, same twin-cylinder smoothness, same round-trip reliability. Same ability to survive a rock or slip a weed. Same luxury features. Same miserly ways.

What did we do to make it so small?

Three things, basically.

We redesigned the combustion chamber and angled the spark plugs to make the powerhead smaller and the hood shorter.

We changed to gear-type starting to make it lower.

We redesigned the fuel filter and throttle linkages to make it narrower.

Any other changes?

Yes. In the process, we added ½ horsepower and lopped 6 lbs. off the weight and 1½ inches off the height.

Now the little Evinrude is the BIG one.

In everything except size.

FREE! Two new catalogs. 1965 motors and boats. At your dealer, or write Evinrude Motors, 4136 N. 27th St., Milwaukee, Wis. 53216.

EVINRUDE

FIRST IN OUTBOARDS

IN CANADA: PETERBOROUGH, ONT.
DIVISION OF OUTBOARD MARINE CORPORATION